EAST NEWTON BUSINESS PARK

NEIGHBOURHOOD CONCEPT PLAN

CITY OF SURREY

PLANNING & DEVELOPMENT DEPARTMENT

SURREY
CITY OF PARKS

EAST NEWTON BUSINESS PARK

NEIGHBOURHOOD CONCEPT PLAN

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MINUTES / Regular Council / 1999 / Monday, March 29, 1999 / A. ADOPTION OF MINUTES / Item No. C415 East Newton Business Park and Live/Work Area, Complete NCP (Development Concept Component)

Item No. C415 East Newton Business Park and Live/Work Area, Complete NCP (Development Concept Component)
File: 2350-003/3

It was

Moved by Councillor Villeneuve
Seconded by Councillor Steele
That Council:

1. Approve the final and complete Neighbourhood Concept Plan (Development Concept Component in Appendix A) for the East Newton Business Park and Live/Work Area;

2. Approve the arrangements, conditions and design guidelines specified in the Neighbourhood Concept Plan as a means of managing the development and the general provision of services, amenities and facilities for the East Newton Business Park and Live/Work Area;

3. Authorize staff to draft an amendment to Zoning By-law, 1993, No. 12000, as amended, to include an amenity contribution provision for the East Newton Business Park and Live/Work Area;

4. Authorize staff to draft an amendment to Surrey Sign By-law, 1999, No. 13656, to include specific sign regulations for the East Newton Business Park as denoted in the Neighbourhood Concept Plan (Design Guidelines);

5. Authorize staff to prepare a strategy for accommodating live/work developments in the East Newton Live/Work Area and other areas of Surrey;

6. Authorize Economic Development staff to incorporate the approved East Newton Business Park and Live/Work Area Neighbourhood Concept Plan into the City's promotional and marketing initiatives toward attracting business park users to locate in Surrey, and to package the approved Neighbourhood Concept Plan in a format to support this objective; and

7. Authorize City staff (Planning & Development, Engineering and Economic Development) to incorporate the East Newton Business Park and Live/Work Area into a pre-servicing and pre-zoning strategy to be implemented in connection with a program to attract more industry and business park users to Surrey.

RES.R99-834 Carried

SURREY
CITY OF PARKS

Corporate Report

CITY MANAGER'S DEPARTMENT

NO: C415

COUNCIL DATE: Mar. 22/99

COUNCIL-IN-COMMITTEE

TO:	**Mayor & Council**	DATE:	**March 17, 1999**
FROM:	**General Manager, Planning & Development**	FILE:	**2350-003/3**

SUBJECT: **East Newton Business Park and Live/Work Area**
Complete Neighbourhood Concept Plan (Development Concept Component)

RECOMMENDATION

The Planning & Development Department recommends that City Council:

1. Approve the final and complete Neighbourhood Concept Plan (Development Concept Component in Appendix A) for the East Newton Business Park and Live/Work Area;

2. Approve the arrangements, conditions and design guidelines specified in the Neighbourhood Concept Plan as a means of managing the development and the general provision of services, amenities and facilities for the East Newton Business Park and Live/Work Area;

3. Authorize staff to draft an amendment to Zoning By-law, 1993, No. 12000, as amended, to include an amenity contribution provision for the East Newton Business Park and Live/Work Area;

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5. Authorize staff to prepare a strategy for accommodating live/work developments in the East Newton Live/Work Area and other areas of Surrey;

6. Authorize Economic Development staff to incorporate the approved East Newton Business Park and Live/Work Area Neighbourhood Concept Plan into the City's promotional and marketing initiatives toward attracting business park users to locate in Surrey, and to package the approved Neighbourhood Concept Plan in a format to support this objective; and

7. Authorize City staff (Planning & Development, Engineering and Economic Development) to incorporate the East Newton Business Park and Live/Work Area into a pre-servicing and pre-zoning strategy to be implemented in connection with a program to attract more industry and business park users to Surrey.

INTENT

The intent of this report is to provide an overview of the Neighbourhood Concept Plan for the East Newton Business Park and Live/Work Area (Appendix A), including a summary of:

(a) the planning process;
(b) the major components of the plan;
(c) implementation measures; and
(d) analyses of the amenity requirements for this Neighbourhood Concept Plan area.

BACKGROUND

General

The East Newton Business Park is located north of approximately 65 Avenue and east of 152 Street. The Business Park area is surrounded on the north, south and east by the Agricultural Land Reserve. The emerging residential neighbourhoods of East Newton (north and south) are located to the west across 152 Street.

The Neighbourhood Concept Plan area consists of 32 lots of various sizes, comprising a total area of approximately 36.5 hectares (90 acres). The area is currently characterized as agricultural/rural residential. A church is located on the south east corner of 68 Avenue and 152 Street neighboured to the south by the SPCA. The two existing streets (66 and 68 Avenues) are currently constructed to an interim standard.

Policy Framework - Surrey's Official Community Plan and the East Newton Local Area Plan

The East Newton Business Park area is designated as INDUSTRIAL in Surrey's Official Community Plan. The Official Community Plan contains a number of directives related to the provision of serviced industrial lands and the creation of jobs for Surrey residents. It further provides guidelines and requirements for the preparation and content of Neighbourhood Concept Plans for Surrey's emerging urban areas.

The East Newton Local Area Plan (approved in February, 1993) designates the subject lands as a business park in order to provide employment opportunities in close proximity to the East Newton area. A copy of the Local Area Plan land use map is attached in Appendix B. The Local Area Plan further directs that a high standard of development and design control should be applied to the area.

The East Newton Business Park and Live/Work Area Neighbourhood Concept Plan was prepared within the above policy framework.

Neighbourhood Concept Plan Process

Overview

A Neighbourhood Concept Plan for the East Newton Business Park was first initiated by a developer in 1994. However, due to the withdrawal of the developer from the process, as well as some disagreements among property owners as to the feasibility of business park development on the subject lands, the process stopped. For several years there was no interest in facilitating a business park plan for the area.

In early 1998, a number of property owners expressed interest in commencing a Neighbourhood Concept Plan for the area. After confirming that the majority of owners wished to directly participate in the process, a Citizen Advisory Committee was established and a number of Committee and public meetings were held to review development options and to allow the owners to voice their concerns and have their comments addressed in the plan.

East Newton Business Park Citizen Advisory Committee (CAC)

To bring local knowledge to the planning process and to facilitate local discussion and communication, a Citizen Advisory Committee was established to assist City staff in preparing the preferred development concept. The Committee consisted of 14 property owners representing the majority of the land area in the Business Park. The Committee met on five occasions, and served as an invaluable resource for reviewing the proposed development concepts, disseminating information and assisting with the selection of a preferred concept.

Public Meetings, Open Houses and Other Communications

The Neighbourhood Concept Plan was initiated in February, 1998 with a public meeting at which a Citizen Advisory Committee was established and general planning issues were identified by owners and the public. A public meeting was held in November, 1998 to allow the public to make comments on and indicate preferences between two development concepts presented. A final public meeting was held in January, 1999 to present the final preferred development concept.

The development concept presented in this report is the concept most preferred by the public and other stakeholders involved in the planning process. It was refined throughout the process to reflect the desires of the participants, and to respond to the various technical issues.

Staff met on various occasions with individual property owners and potential business park developers to resolve potential concerns and facilitate land assembly and interest in the future Business Park.

Summary of Land Owner Concerns

Existing Small Land Parcels Near 66 Avenue and 152 Street (See Map in Appendix C)

The owners of four small land parcels near 66 Avenue and 152 Street have expressed concern that they will not realize the full value of their properties under a Business Park designation because of the size of the parcels (the four lots are 10,000 - 12,000 square feet in size). One of the owners has argued that these parcels should be designated commercial (i.e. shopping centre) to increase their value. Commercial is not appropriate here because two existing commercial centres are located on 152 Street in very close proximity, which well serve the residential neighbourhoods in the area. The Sullivan Station commercial node is located at 152 Street and 64 Avenue. The David Hunter Nursery along with a commercial centre and a gas station will be developed at 152 Street and 72 Avenue.

The East Newton Neighbourhood Concept Plan proposes a small commercial site at 152 Street and 66A Avenue which is intended to serve the commercial needs of the Business Park. The commercial site is located at 66A Avenue rather than at 66 Avenue adjacent to the small parcels because: a) 66A Avenue will be the main entrance into the Business Park; b) 66 Avenue (adjacent to the small parcels) must be closed in order to have a safe and proper intersection at the entrance to the Business Park (it must line up with the existing 66A Avenue on the west side of 152 Street); and c) a commercial centre on the small lots would have poor vehicular access off of 152 Street.

It is noted that the proposed commercial site at 66A Avenue is confined to a small area (0.3 ha. or 0.77 acres) to ensure that it doesn't develop into another large commercial node on 152 Street.

To allay the concerns of the owners of the small lots, the Neighbourhood Concept Plan includes the option for these owners to redevelop as live/work. This designation would allow some degree of land use flexibility (i.e. professional office, small manufacturing and residence) and consequently the value of the lots can be maintained or may increase with the eventual development of the area.

Proposed Business Park Expansion South to 64 Avenue (See Map in Appendix C)

The owner of lands south and adjacent to the Business Park has approached the City to incorporate an additional 25 acres (between the Business Park and 64 Avenue) into the Neighbourhood Concept Plan. These lands are located within the Agricultural Land Reserve and are designated Agriculture in Surrey's Official Community Plan. The owner has prepared a plan for the redevelopment of these lands and has met with City staff to discuss the feasibility of removing the lands from the Agricultural Land Reserve and developing them for business park purposes. This proposal represents a major departure from current development policy, and if it was addressed within the Neighbourhood Concept Plan process, would have caused major time and approval delays. The applicant may be pursuing this proposal through separate application and plan amendment processes.

Input and Review by City Departments, Government and Other Agencies

The City's project team involved in preparing the development concept and servicing/funding strategy included staff from Planning & Development, Engineering, Parks, Recreation & Culture, and Engineering and Environmental consultants. This team-oriented approach has resulted in the optimal development concept which addresses the public, municipal and technical objectives of all stakeholders. Relevant government agencies were also consulted and their concerns have been incorporated into the final Neighbourhood Concept Plan.

Input and Review by Surrey's Agricultural Advisory Committee

The Agricultural Advisory Committee reviewed the Neighbourhood Concept Plan and indicated that it supports the full business park option rather than the live/work option and also noted concern with a cul-de-sac south of 152A Street.

This cul-de-sac has been revised to not end at the Agricultural Land Reserve and the option for a full business park remains.

Work Place (Business Park & Live/Work) Opportunity Study for East Newton

To ensure that the development concept for the Business Park meets market needs, and to confirm the potential viability of the lands for both business park and live/work developments, the City engaged an economic/marketing consultant to evaluate this business park location along with proposed business parks in Rosemary Heights and Clayton.

The results of this study pertinent to the East Newton Business Park & Live/Work Area are:

- the site has excellent accessibility and exposure characteristics,
- there are only limited amounts (if any) of competing business park space in this market, and there is expected to be relatively strong market demand for business park space at this location,
- the existing land use is of a sufficiently low intensity that land acquisition and redevelopment should not be difficult,
- the site is located in close proximity to existing/planned residential neighbourhoods,
- the central location of this site and its rural setting makes it a strong location for a business park,
- the site is of a sufficient size to interest development firms but not so large as to render the land unmarketable, and,
- the site's shape (i.e. square) is positive as it will allow for a number of site plan arrangements.

DISCUSSION

Overview of the Development Concept

The development concept map of the East Newton Business Park & Live/Work Area Neighbourhood Concept Plan is contained in Appendix D. This preferred development concept envisages an executive Business Park which will accommodate low-impact businesses such as high-tech industries, research and development companies, light manufacturing and corporate head offices.

The lands south of 66 Avenue are proposed to accommodate either business park uses or live/work developments. In order to ensure land use compatibility and viable sizes of development sites, development/property groupings are prescribed under which either live/work or business park uses can be developed.

The development concept also proposes a small commercial site at the entrance to the Business Park (152 Street and 66A Avenue), which is intended to provide local commercial services to the Business Park and live/work area.

There is proposed to be a park located at the south east corner of the area which will serve the residents of the live/work area and the employees in the Business Park. It is noted that the park will not be required in the event that the entire area (including the lands south of 66 Avenue) is developed as a Business Park. The necessity of the park will be determined once the lands north of 66 Avenue begin to redevelop and set the tone of the Business Park (development will occur from north to south due to servicing considerations).

To accommodate storm water run-off and quality, a bio-filtration facility (which will resemble marsh land) is proposed at the north east corner of the Business Park. This facility will also serve as an amenity enabling employees to enjoy it as a passive recreation area.

The Business Park will also have gateway features at both entrances, a small plaza and privately owned pathways throughout the development to connect the buildings to the various amenities in the area.

The Business Park is expected to accommodate about 112,500 square metres (1,400,000 square feet) of business park/commercial space (depending on the extent of live/work uses) and could create over 3,000 jobs. The following table documents the basic land use statistics of the Plan:

EAST NEWTON BUSINESS PARK AND LIVE/WORK AREA LAND USE STATISTICS				
Land Use	**Area (approx.)**	**Projected Floor Area (Business)[1]**	**Projected Number of Dwelling Units**	**Projected No. of Jobs [2]**
Business Park	22.5 ha. 55.6 acres	112,500 sq. m. 1,210,980 sq.ft.	N/A	3,089
Live/Work	5.91 ha. 14.6 acres	29,550 sq. m. 318,084 sq. ft.	117	175
Park	1.94 ha. 4.8 acres	N/A	N/A	N/A
Neighbourhood Commercial	0.3 ha. 0.77 acres	1,500 sq. m. 16,146 sq. ft.	N/A	7
Existing Church	1.4 ha. 3.48 acres	N/A	N/A	N/A
Bio-filtration Pond	0.93 ha. 2.3 acres	N/A	N/A	N/A
Roads	4.94 ha. 12.2 acres	N/A	N/A	N/A
TOTALS	**38 hectares 94 acres**	**129,879 sq.m. 1,398,052 sq.ft.**	**117**	**3,271**

Environmental Issues

Raptor Nest Protection

An environmental analysis of the area indicated that there are three important raptor (hawk) nests located at the northern extreme of the Business Park. B.C. Environment has indicated that these nests are a high priority for protection because they are located beside the Agricultural Land Reserve (foraging habitat) and have been highly productive in past years (2-3 young produced in most of the 10+ years that the site has been used).

Consequently, the Neighbourhood Concept Plan identifies the approximate location of the nests and indicates that they must be protected in accordance with B.C. Environment's requirements. The precise protection measures will be formulated and implemented at the time of rezoning. Protection measures may include buffer areas around the nests and retention of the trees and foraging areas.

[1] Projected floor area is based upon an estimated 0.5 FAR.

[2] Projected number of jobs is based upon one employee per 250 square feet (50% office) and 24 employees per acre (50% light industrial). Live/work employment is based upon 1.5 jobs per unit.

Watercourse Issues

The environmental analysis also included an assessment of all watercourses within the proposed Business Park. The environmental consultant put forth several recommendations regarding the classification of watercourses (mostly ditches). It is noted that the proposed bio-filtration facility will improve the fish habitat in the area. City staff met on numerous occasions with the environmental agencies to work out acceptable storm water management and watercourse protection measures. The environmental agencies generally concurred with the proposals in the Neighbourhood Concept Plan and environmentally sound practices will be implemented accordingly.

Tree Preservation

There are several Sequoia trees located near 152 Street, south of 68 Avenue, as well as a significant wood lot located in the north east corner of the Business Park. Steps will be taken through the implementation of the Design Guidelines to retain and incorporate these trees into the design of business park developments.

Interface with the Agricultural Land Reserve

It is noted that the Business Park is surrounded on three sides by the Agricultural Land Reserve. To negate any land use conflict, a 15 metre (49.2 feet) buffer (landscaped on private property) will be required on all properties in the Business Park that abut the agricultural lands. These buffers will be landscaped in accordance with the specifications recommended by the Agricultural Land Commission.

Buffer design requirements are further identified in the Design Guidelines for the Business Park. In addition, and on the advice of Surrey's Agricultural Advisory Committee, no roads or cul-de-sacs will end at the boundary of the Agricultural Land Reserve.

Design Guidelines

The Neighbourhood Concept Plan contains a set of Design Guidelines which will ensure that a high quality, well landscaped Business Park is achieved. The Design Guidelines address such issues as:

- compatibility of building design,
- the streetscape along 152 Street and internal roads,
- buffer landscaping, and
- gateways, view points, entrance plaza, open space development and tree preservation.

Engineering Services, Phasing and Funding

A general servicing plan, overall road pattern, storm water management strategy, and phasing and funding strategy have been developed as a critical component of the Neighbourhood Concept Plan. These issues are addressed in a consultant's report and

accompanying recommendations from the Engineering Department (to be considered by Council concurrently with this report).

The East Newton Business Park is under consideration for potential pre-servicing arrangements. Pre-zoning the lands would therefore also be considered to assist in attracting new business to the area early and in a timely fashion.

To enhance the quality of the Business Park and create its unique identity, several gateway features (e.g. specially lit and landscaped identification signs, fountain, etc.) are proposed at the entrances to the Business Park. These features will likely be constructed within the road right-of-ways and the details, costs and cost-sharing arrangements (among property owners) will be addressed as part of the pre-servicing strategy for the area.

Amenity Requirements

To address the amenity needs of the proposed new development in this area, at the time of rezoning, development proposals will be required to make a monetary contribution toward the provision of new police and fire protection services and toward the development of the parks, open space and pathways. Live/work developments will also be required to contribute toward the provision of library materials for the residents of the live/work area.

The monetary contributions toward police, fire and library materials will offset the capital costs of providing these services to the new development and are applied on a standardized basis in all of Surrey's Neighbourhood Concept Plan areas. The monetary contributions toward park, open space and pathway development are based upon an estimate of the capital costs of these improvements for this particular Neighbourhood Concept Plan area. The total cost is divided among the anticipated acreage and number of dwelling units to ensure an equitable contribution arrangement.

The estimated cost of developing the park-related amenities is approximately $186,500, which consists of the following:

Site preparation (2.5 acres)	$50,000
Playground equipment	$35,000
Road fronting park	$15,000
Site furniture and signs	$11,500
Pathways and trails	$40,000
Landscaping	$20,000
Consulting fees/public meetings	$15,000

A summary of the applicable amenity contributions (per acre or unit) and the estimated revenue the City can expect to receive from this Neighbourhood Concept Plan area are presented in the following table:

EAST NEWTON BUSINESS PARK AND LIVE/WORK AREA AMENITY CONTRIBUTIONS			
	Per Acre Contribution Business Park *Approx. 55 acres*	**Per Acre Contribution Live/Work Area** *Approx. 15 acres*	**Anticipated Revenue**
Police Protection	$201.60 per acre	$201.60 per acre	$14,112
Fire Protection	$870.92 per acre	$870.92 per acre	$60,964.40
Pathways/Plazas/ Park	$2,664.30 per acre	$2664.30 per acre	$186,500*
Library Materials	N/A	$113.40 per unit *@ 8 units per acre*	$13,267.80
Total Contribution (per acre)	**$3,736.82 per acre**	**$3,736.82 per acre** *plus $113.40 per unit for libraries*	
Total Anticipated Revenue			**$274,844.20**

* If the park is not required, the funding which is related to the park development will be used to fund the capital cost of improving open space in the Business Park (e.g., pathways, plazas, enhanced landscaping, etc.)

Implementation of the Neighbourhood Concept Plan

Park Acquisition

It is estimated that at today's value, the proposed park will cost approximately $720,000 to $864,000 to acquire. This park is currently not on the City's priority acquisition list. In addition, development in the Business Park will not generate any Development Cost Charge revenue for park land (industrial developments are exempted). It is also unlikely that any substantial revenue will be received through subdivisions in the Business Park and the 5% cash-in-lieu of park dedication (under the Municipal Act), as subdivisions of three or less lots are exempt from this requirement.

However, it is expected that live/work developments (which prompt the necessity of the park) may be required to pay Development Cost Charges for park land. It is expected that some subdivisions for live/work developments may also occur which will allow for the contribution of 5% cash-in-lieu toward the acquisition of park land.

Based upon some preliminary estimates of the development and subdivision potential of the live/work area, it is projected that possibly $730,000 to $900,000 could be received from Development Cost Charges on the assumption that all of the land designated for live/work is developed at a density of 6 to 8 units per acre. [3]

[3] This estimate assumes that the area will be developed at 8 units per acre. As of March, 1999, the DCC rate for park land acquisition is $8,380 per single family (RF) lot.

Development Requirements for Business Park or Live/Work Area (south of 66 Avenue)

To ensure comprehensive and compatible developments in the optional live/work or Business Park area south of 66 Avenue, certain blocks or property groupings should be developed together. The groupings are identified in the attached Neighbourhood Concept Plan.

Design Guidelines

In order to achieve a comprehensively designed Business Park in an open space/campus-like setting, all development proposals in the Business Park will be required to comply with the Design Guidelines forming part of the Neighbourhood Concept Plan.

Sign By-law Amendment

In order to maintain a high quality and visually attractive streetscape in the Business Park, more restrictive sign guidelines are proposed. It is proposed that no free-standing signs be permitted along 152 Street and that low, architecturally co-ordinated signs be maintained throughout the Business Park. Accordingly, Surrey's new Sign By-law will need to be amended to contain specific sign regulations for the East Newton Business Park.

Zoning By-law Amendments

To enact the amenity contribution requirement, Surrey's Zoning By-law will need to be amended to add the East Newton Business Park and Live/Work Area to the list of Neighbourhood Concept Plans within which monetary contributions are required.

Live/Work Developments Study

The concept of designing and building new live/work developments, particularly in the Surrey context, is yet untried, although market research suggests that there is a pent up demand for this unique and innovative housing/business accommodation. The benefits of this type of development are that it would provide more choice and affordability in the housing/business market and could serve as an incubator for small businesses in Surrey.

The City has recently secured a $10,000 grant from the A-C-T Program (UBCM) to conduct research and develop policies and regulations on the applicability and implementation of live/work developments in Surrey. This study will place particular emphasis on proposed live/work developments in East Newton, Rosemary Heights and East Clayton. A report and recommendations arising from this study will be forwarded to City Council for consideration, and consequent policies and zoning mechanisms will be implemented in conjunction with live/work development proposals.

Raptor Nest Protection

The protection of the three raptor nests in the north east section of the Business Park will be incorporated into the design of any development proposed for this site. Appropriate buffers and other protective measures will be in accordance with the requirements and recommendations of B.C. Environment.

Cost-sharing of Gateway Features

Details of the gateway features, construction costs and cost-sharing arrangements will be addressed through the pre-servicing strategy established for the East Newton Business Park.

Economic Development - Pre-zoning and Pre-servicing

Surrey's Official Community Plan indicates as a key future direction, that the City should provide an adequate supply of accessible and serviced land for commerce and industry, because job creation is a critical element of the City's Economic Development Strategic Plan. The approval of the East Newton Business Park and subsequent rezoning and servicing would meet the following policy directives contained in the Official Community Plan:

- co-ordinate planning and economic development,
- create jobs close to home,
- pre-service sufficient industrial land for new business,
- encourage clean industries,
- service industrial land in advance,
- improve City infrastructure for economic development, and,
- establish industrial and business parks.

To fulfil this mandate, the City should consider pre-servicing and pre-zoning the East Newton Business Park and establish programs to assist with its timely development.

CONCLUSION

A City project team, in consultation with the property owners and the public, have prepared a development concept and engineering/funding/phasing strategy for the East Newton Business Park and Live/Work area.

The Neighbourhood Concept Plan addresses the objectives identified by the property owners and the community, and is consistent with the policy framework identified in Surrey's Official Community Plan and the East Newton Local Area Plan. Strategies have been identified for funding various amenities required for the Business Park and for ensuring that the Business Park will be a high quality, comprehensively designed development within a campus-like setting.

To ensure the successful and early development of the Business Park, programs for promoting development and marketing are proposed to be undertaken. An impending study of live/work developments in the Surrey context will be undertaken to ensure the viability and successful implementation of this new innovative land use.

Subject to Council's concurrence with the related report from the Engineering Department, it is recommended that the Neighbourhood Concept Plan for the East Newton Business Park and Live/Work area and the issues discussed in this report, be endorsed.

ORIGINAL SIGNED BY

Murray D. Dinwoodie
General Manager
Planning & Development Department

WW/ln

Appendices

Appendix A East Newton Business Park and Live/Work Area Neighbourhood Concept Plan
Appendix B East Newton Local Area Plan (Land Use Plan)
Appendix C Land Owner Concerns
Appendix D East Newton Business Park and Live/Work Area Development Concept Map

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SURREY
CITY OF PARKS

EAST NEWTON BUSINESS PARK AND LIVE/WORK AREA

NEIGHBOURHOOD CONCEPT PLAN
(Development Concept Component)

(Appendix A)

March, 1999

EAST NEWTON BUSINESS PARK AND LIVE/WORK AREA NEIGHBOURHOOD CONCEPT PLAN

(Development Concept Component)

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EAST NEWTON BUSINESS PARK AND LIVE/WORK AREA

NEIGHBOURHOOD CONCEPT PLAN
(Development Concept Component)

1. INTRODUCTION

A City project team, in consultation with the property owners and the public, have prepared this Neighbourhood Concept Plan (development concept and engineering/funding/phasing strategy) for the East Newton Business Park and Live/Work area in the Newton or central area of Surrey.

The Neighbourhood Concept Plan addresses the objectives identified by the property owners and the community, and is consistent with the policy framework identified in Surrey's Official Community Plan and the East Newton Local Area Plan. Strategies have been identified for funding various amenities required for the Business Park and for ensuring that the Business Park will be a high quality, comprehensively designed development within a campus-like setting.

To ensure the successful and timely development of the Business Park, programs for promoting development and marketing will be implemented. An impending study of live/work developments in the Surrey context will be undertaken to ensure the viability and successful implementation of this new innovative land use.

This Neighbourhood Concept Plan is intended to be conceptual in nature and the components of the development concept (Appendix I) may vary in size but not in general location. Some flexibility has been built in to the Plan to allow alternative local road patterns to accommodate the acreage requirements of potential Business Park users.

Any proposed major or minor amendments to this Neighbourhood Concept Plan must be undertaken in accordance with Council's approved Neighbourhood Concept Plan amendment policy.

2. STUDY AREA CHARACTERISTICS

The East Newton Business Park is located north of approximately 65 Avenue and east of 152 Street in the Newton area of Surrey (see context map in Appendix II). The Business Park area is surrounded on the north, south and east by the Agricultural Land Reserve. The lands offer excellent views of the mountains and surrounding low lands. The

emerging residential neighbourhoods of East Newton (north and south) are located to the west across 152 Street.

The Neighbourhood Concept Plan area consists of 32 lots of various sizes, comprising a total area of approximately 36.5 hectares (94 acres). The area is currently characterized as agricultural/rural residential. A church is located on the south east corner of 68 Avenue and 152 Street neighboured to the south by the SPCA. The two existing streets (66 and 68 Avenues) are currently constructed to a limited standard.

The lands are considered suitable for business park development due to the following characteristics:

- the site has excellent accessibility and exposure characteristics,
- there are only limited amounts (if any) of competing business park space in this market, and there is expected be relatively strong market demand for business park space at this location,
- the existing land use is of a sufficiently low intensity that land acquisition and redevelopment should not be impaired,
- the site is located in close proximity to existing/planned residential neighbourhoods,
- the central location of this site and its rural setting makes it a strong location for a business park,
- the site is of a sufficient size to interest development firms but not so large as to render the land unmarketable, and,
- the site's shape (i.e. square) is positive as it will allow for a number of site plan arrangements.

3. POLICY FRAMEWORK - SURREY'S OFFICIAL COMMUNITY PLAN (OCP) AND THE EAST NEWTON LOCAL AREA PLAN (LAP)

The East Newton Business Park area is designated as INDUSTRIAL in Surrey's Official Community Plan (see OCP map in Appendix III). The Official Community Plan contains a number of directives related to the provision of serviced industrial lands and the creation of jobs for Surrey residents. It further provides guidelines and requirements for the preparation and content of Neighbourhood Concept Plans for Surrey's emerging urban areas.

The East Newton Local Area Plan (approved in February, 1993) designates the subject lands as a business park in order to provide employment opportunities in close proximity to the East Newton area (see LAP land use plan in Appendix IV). The Local Area Plan further directs that a high standard of development and design control should be applied to the area.

The East Newton Business Park and Live/Work Area Neighbourhood Concept Plan was prepared within the above policy framework.

4. OVERVIEW OF THE PLAN

4.1. Business Park and Live/Work (Optional) Area

4.1.1. The development concept (see Appendix I) envisages an executive Business Park which will accommodate low-impact businesses such as high-tech industries, research and development companies, light manufacturing and corporate head offices.

4.1.2. The lands south of 66 Avenue may accommodate either business park uses or live/work developments. In order to ensure land use compatibility and viable sizes of development sites, development/property groupings (see Appendix V) are prescribed under which either live/work or business park uses can be developed.

4.1.3. The Business Park is expected to accommodate about 112,500 metres (1,400,000 square feet) of business park/commercial space (depending on the extent of live/work uses) and could create over 3,000 jobs. The table in Appendix VI illustrates the basic land use statistics of the development concept:

4.1.4. While the precise nature of live/work development is largely undefined, the market appeal and affordability potential prompted the inclusion of this innovative housing/business type in the Neighbourhood Concept Plan.

4.1.5. The details of density, form and design of this type of development along with regulatory/building code issues will be refined, following the completion of a Live/Work Developments Study.

4.1.6. If live/work concept is determined not to be feasible, the Neighbourhood Concept Plan contemplates the option of business park uses for the lands south of 66 Avenue.

4.1.7. There is an existing church at the south east corner of 152 Street and 68 Avenue. This site may or may not be redeveloped for business park uses in the future.

4.2. Commercial

4.2.1. The development concept contains a small commercial site at the entrance to the Business Park (152 Street and 66A Avenue), which is intended to provide local commercial services to the Business Park and live/work area.

4.3. Park, Pathways, Open Space and Gateways

4.3.1. There is proposed to be a park located at the south east corner of the area which will serve the residents of the live/work area and the employees in the Business Park.

4.3.2. The park will not be required in the event that the entire area is developed as a Business Park. The necessity of the park will be determined once the lands north of 66 Avenue begin to redevelop and set the tone of the Business Park (development will occur from north to south due to servicing considerations).

4.3.3. To accommodate storm water run-off and quality, a bio-filtration facility (which will resemble marsh land) is proposed at the north east corner of the Business Park. This facility will also serve as an amenity enabling employees to enjoy it as a passive recreation area.

4.3.4. The Business Park will also have gateway features at both entrances, a small urban plaza and privately owned pathways throughout the development to connect the buildings to the various amenities in the area.

5. ENVIRONMENTAL PROTECTION

5.1. Raptor Nest Protection

5.1.1. An environmental analysis of the area indicated that there are three important raptor (hawk) nests located at the northern extreme of the Business Park (see locational map in Appendix VII). B.C. Environment has indicated that these nests are a high priority for protection because they are located beside the Agricultural Land Reserve (foraging habitat) and have been highly productive in past years (2-3 young produced in most of the 10+ years that the site has been used).

5.1.2. These nests must be protected in accordance with B.C. Environment's requirements, which will include buffer areas to ensure that the nests are not disturbed. The precise protection measures will be formulated and implemented at the time of rezoning.

5.2. Watercourses

5.2.1. Existing watercourses and their classifications have been examined by an environmental consultant and several recommended changes are necessary to implement this Neighbourhood Concept Plan.

5.2.2. A letter (and accompanying maps/photos) from Envirowest Environmental Consultants along with a letter from BC Environment (both contained in Appendix VIII) will be used to assist in managing the watercourses and fish habitat within the area.

5.3. Tree Preservation

5.3.1. There are several Sequoia (Giant Red Wood) trees located near 152 Street (see locational map in Appendix IX). These trees should be maintained and incorporated into the design of business park developments on the applicable sites

5.3.2. There is a significant wood lot located in the north east corner of the Business Park. This wood lot should also be retained and incorporated into the design of business park developments.

5.3.3. All significant trees and/or groups of trees should be retained on the sites and incorporated into the design of developments in the Business Park and live/work area.

5.3.4. Tree preservation is also addressed in the Design Guidelines for the Business Park (see Appendix X).

6. INTERFACE WITH AGRICULTURAL LANDS

6.1. The Business Park is surrounded on three sides by the Agricultural Land Reserve. To negate any land use conflict, a 15 metre (49.2 foot) buffer (landscaped on private property) will be required on all properties in the Business Park that abut the agricultural lands.

6.2. These buffers will be landscaped in accordance with the specifications recommended by the Agricultural Land Commission.

6.3. Buffer design requirements are further unidentified in the Design Guidelines for the Business Park (Appendix X).

6.4. On the advice of Surrey's Agricultural Advisory Committee, no roads or cul de sacs will end at the boundary of the Agricultural Land Reserve.

7. ENGINEERING SERVICES, FINANCING AND PHASING

7.1. A general servicing plan, overall road pattern, storm water management strategy, and phasing and funding strategy have been developed as a critical component of the Neighbourhood Concept Plan. These issues are addressed in a report by Aplin

& Martin Consultants. This report forms part of this Neighbourhood Concept Plan.

7.2. The East Newton Business Park is under consideration for potential pre-servicing and pre-zoning. Development proponents should contact the Engineering Department to determine the current status of the servicing and financing arrangements.

7.3. To enhance the quality of the Business Park and to create its unique identity, several gateway features (e.g. specially lit and landscaped identification signs, fountain, etc.) will be constructed at the entrances to the Business Park.

7.4. The details, construction costs and cost-sharing arrangements for these gateway features will be addressed in the pre-servicing strategy for this area.

7.5. It is likely that the features may be constructed wholly or partially within road-right-ways.

8. DESIGN GUIDELINES

8.1. The Design Guidelines in Appendix X will be applied to all development in order to ensure that a high quality, well landscaped Business Park is achieved.

8.2. The Design Guidelines address such issues as:

- compatibility of building design,
- the streetscape along 152 Street and internal roads,
- buffer landscaping, and,
- gateways, view corridors, urban plaza, open space development and tree preservation.

8.3. For illustrative purposes, some preliminary Design Guidelines for the live/work area are contained in Appendix XI. These preliminary Guidelines will be further developed as part of a study undertaken by the Planning & Development Department with the assistance of a consultant.

9. ZONING

9.1. Developments for business park uses in the East Newton Business Park will generally be designed and built under the IB - Business Park Zone.

9.2. The commercial site will be zoned C4 - Local Commercial.

9.3. Zoning mechanisms to accommodate the live/work area will be investigated within the context of a study underway to examine the applicability and

implementation aspects of live/work developments. Development proponents should contact the Planning & Development Department to determine the status of this study and the associated recommendations.

9.4. A CD - Comprehensive Development Zone may be used to accommodate mixed integrated developments.

10. DEVELOPMENT RESTRICTIONS FOR THE OPTIONAL BUSINESS PARK OR LIVE/WORK AREA SOUTH OF 66 AVENUE

10.1. The lands south of 66 Avenue are proposed to accommodate either business park uses or live/work developments. To ensure compatibility and feasible development areas, certain groups of properties must be developed together as comprehensive developments for business park or live/work. The map in Appendix V identifies three areas (A, B, & C). The properties within each area must be developed together or at least for the same use.

10.2. Some preliminary Design Guidelines (see Appendix XI) have been prepared to provide some general ideas on the concept of live/work developments.

11. PARK ACQUISITION

11.1. It is estimated that the proposed park will cost approximately $690,000 to acquire. This park is currently not on the City's priority acquisition list. In addition, development in the Business Park will not generate any Development Cost Charge revenue for park land (industrial developments are exempt). It is also unlikely that any substantial revenue will be received through subdivisions in the Business Park and the 5% cash-in-lieu of park dedication (under the Municipal Act), as subdivisions of three or less lots are exempt from this requirement.

11.2. However, it is expected that live/work developments (which prompt the necessity of the park) may be required to pay Development Cost Charges for park land (if they consist of multiple units). It is expected that some subdivisions for live/work developments may also occur which will allow for the contribution of 5% cash-in-lieu toward the acquisition of park land.

11.3. Based upon some preliminary estimates of the development and subdivision potential of the live/work area, it is projected that possibly over $900,000 could be received from both Development Cost Charges given the assumption that all of the land designated for live/work is developed at least 8 units per acre.[1]

[1] This estimate assumes that the area will be developed at 8 units per acre. As of March, 1999, DCC rates for park land acquisition is $8,380 per lot for a single family (RF) lot.

12. LIVE/WORK DEVELOPMENTS STUDY

12.1. The concept of designing and building new live/work developments, particularly in the Surrey context, is yet untried, although market research suggests that there is a pent up demand for this unique and innovative housing/business accommodation. The benefits of this type of development are that it would provide more choice and affordability in the housing/business market and could serve as an incubator for small businesses in Surrey.

12.2. The City has recently secured a $10,000 dollar grant from the A-C-T program to conduct research and develop policies and regulations on the applicability and implementation of live/work developments in Surrey. This study will place particular emphasis on proposed live/work developments in East Newton, Rosemary Heights and East Clayton. A report and recommendations arising from this study will be forwarded to City Council for consideration, and consequent amendments to the East Newton Business Park Neighbourhood Concept Plan may be required.

13. AMENITY REQUIREMENTS

13.1. To address the amenity needs of the proposed new development in this area, at the time of rezoning, development proposals will be required to make a monetary contribution toward the provision of new police and fire protection services and toward the development of the parks, open space and pathways.

13.2. The monetary contributions toward police, fire and library materials will offset the capital costs of providing these services to the new development and are applied on a standardized basis in all of the Surrey's Neighbourhood Concept Plan areas. The monetary contributions toward park, open space and pathway development are based upon an estimate of the capital costs of these improvements for this particular Neighbourhood Concept Plan area. The total cost is divided among the anticipated acreage and number of dwelling units to ensure an equitable contribution arrangement.

13.3. Live/work developments will be required to contribute toward the provision of library materials for the residents of the live/work area.

13.4. The estimated cost of developing the park-related amenities is approximately $186,500, which consists of the following:

Site preparation (2.5 acres)	$50,000
Playground equipment	$35,000
Road fronting park	$15,000
Site furniture and signs	$11,500
Pathways and trails	$40,000
Landscaping	$20,000
Consulting fees/public meetings	$15,000

13.5. A summary of the applicable amenity contributions (per acre or unit) and the estimated revenue the City can expect to receive from this Neighbourhood Concept Plan area are presented in table contained in Appendix XII.

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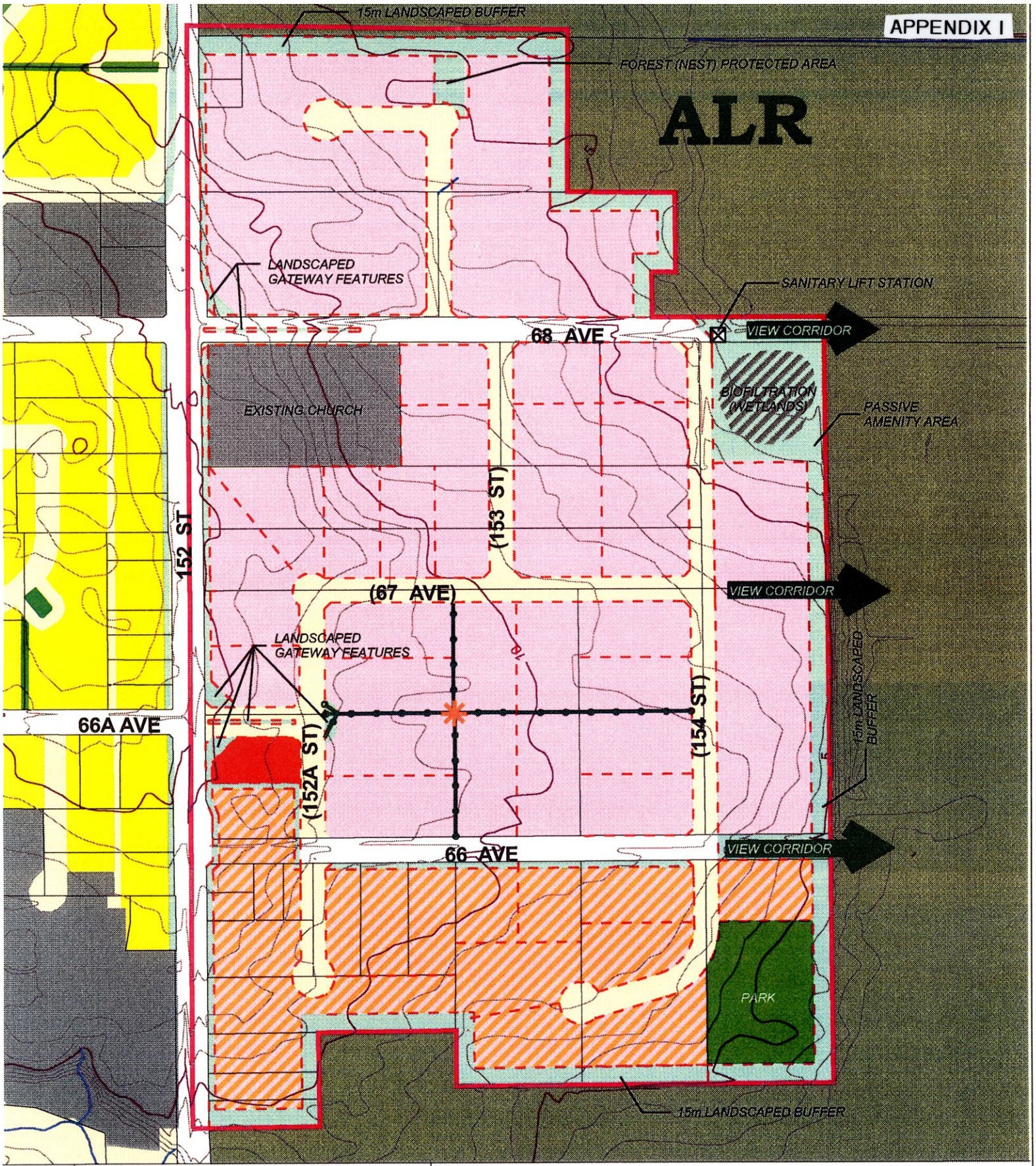


N

East Newton Business Park Neighbourhood Concept Plan Proposed Land Use Concept

City of Surrey Planning & Development Department

NOTE: This Plan is conceptual in nature and is only intended to reflect a general pattern of land uses.

30 0 30 60 Meters

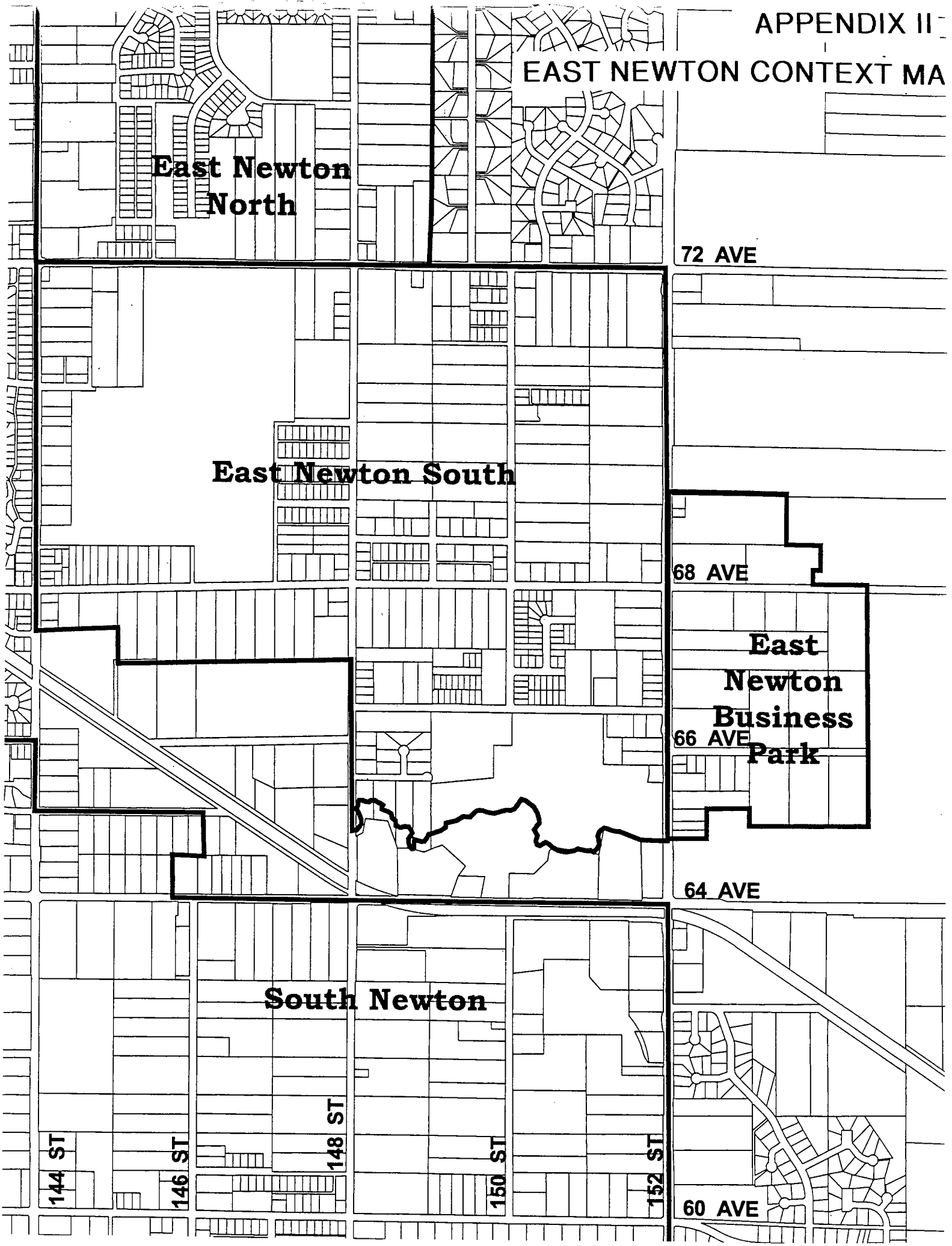
Date: March 3, 1999

Fig. 1

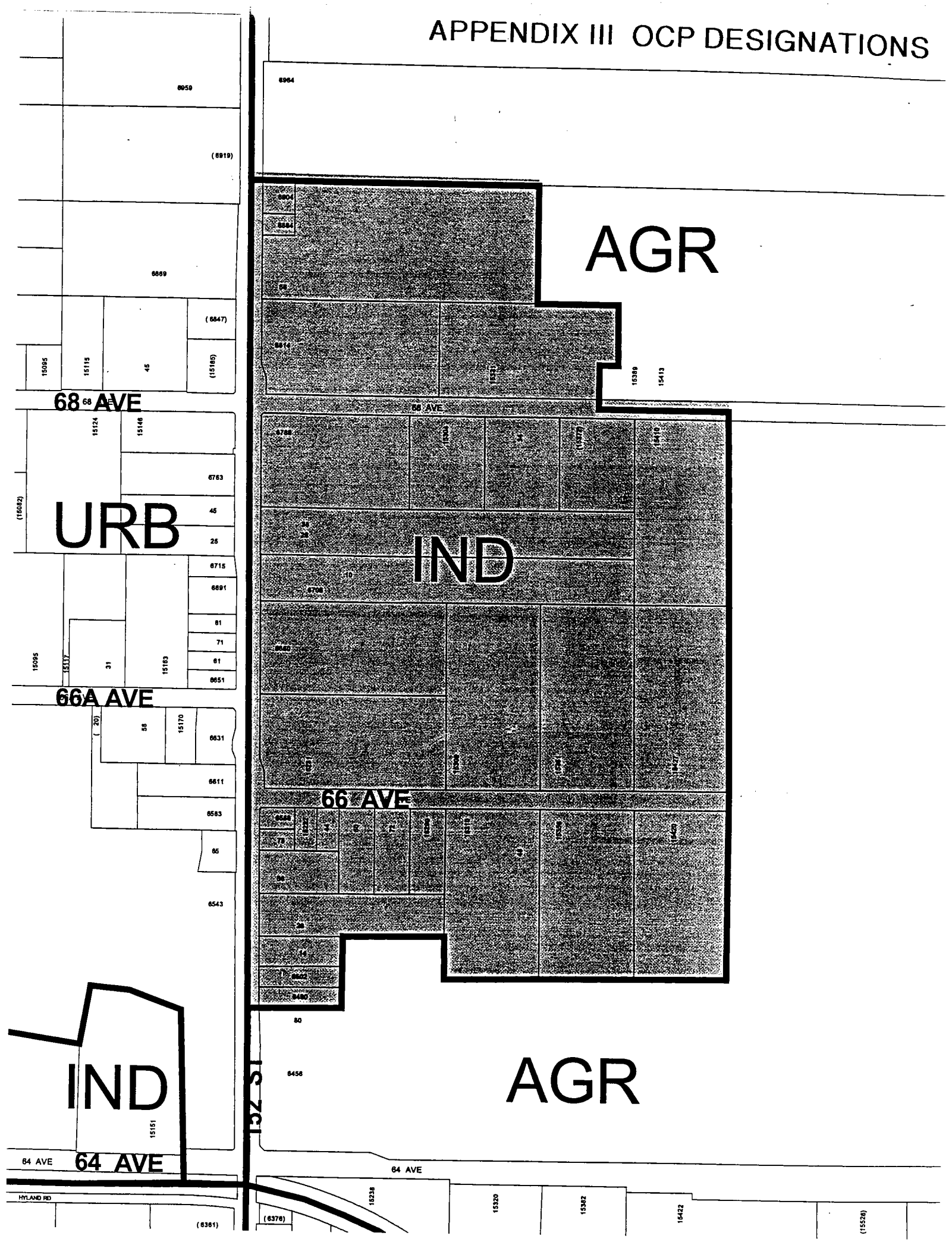
LEGEND

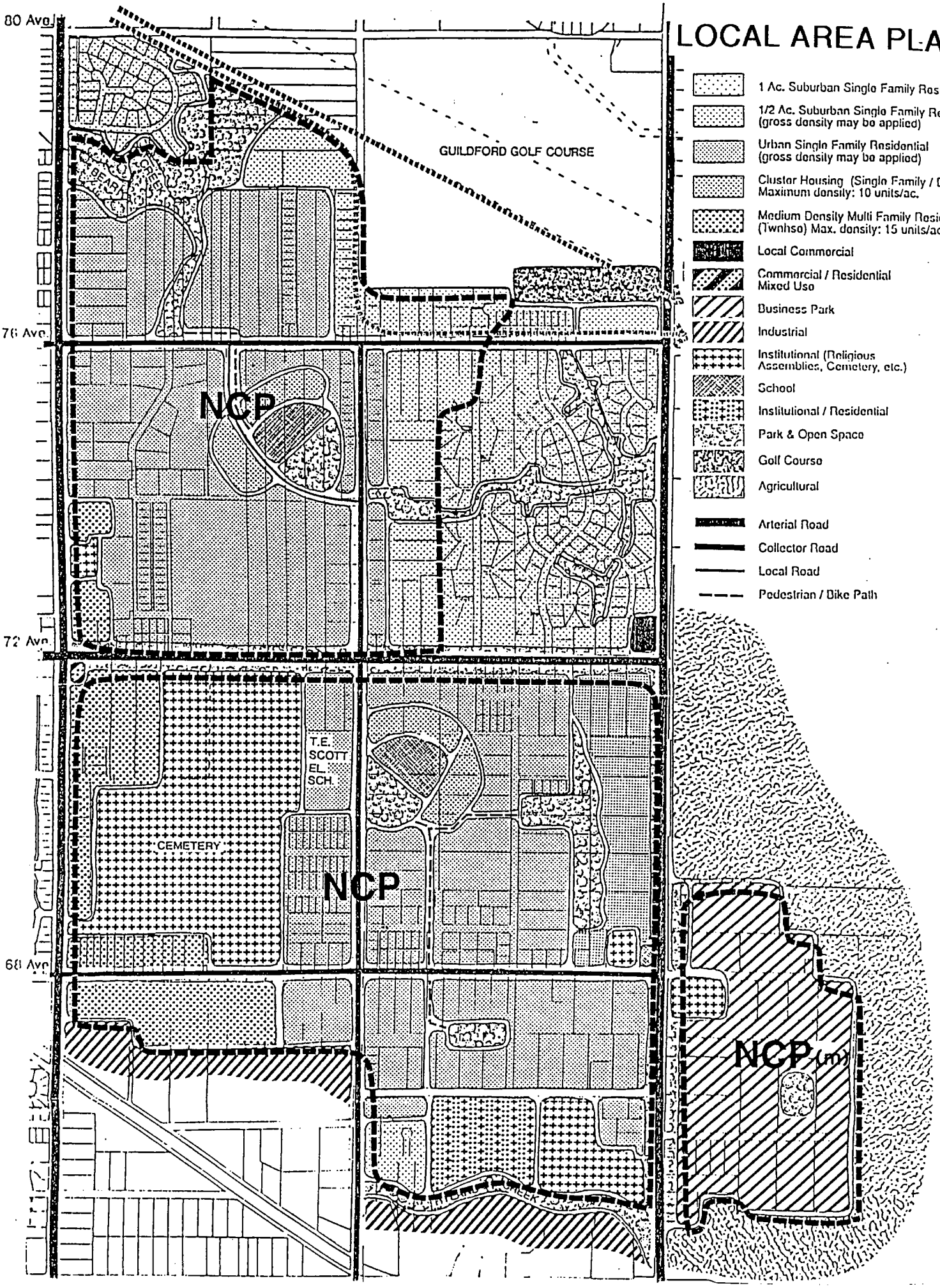
- East Newton Business Park NCP Boundary
- Buffers / Natural Areas
- Business Park
- Local Commercial
- Existing Church
- Park
- Live & Work (or future business park)
- Agricultural Land Reserve
- Biofiltration (wetland) Facility
- Proposed Roads & Lots
- Contours 1m
- Contours 5m
- Landscaped Pathways (private property)
- Possible Small Urban Plaza (privately owned)

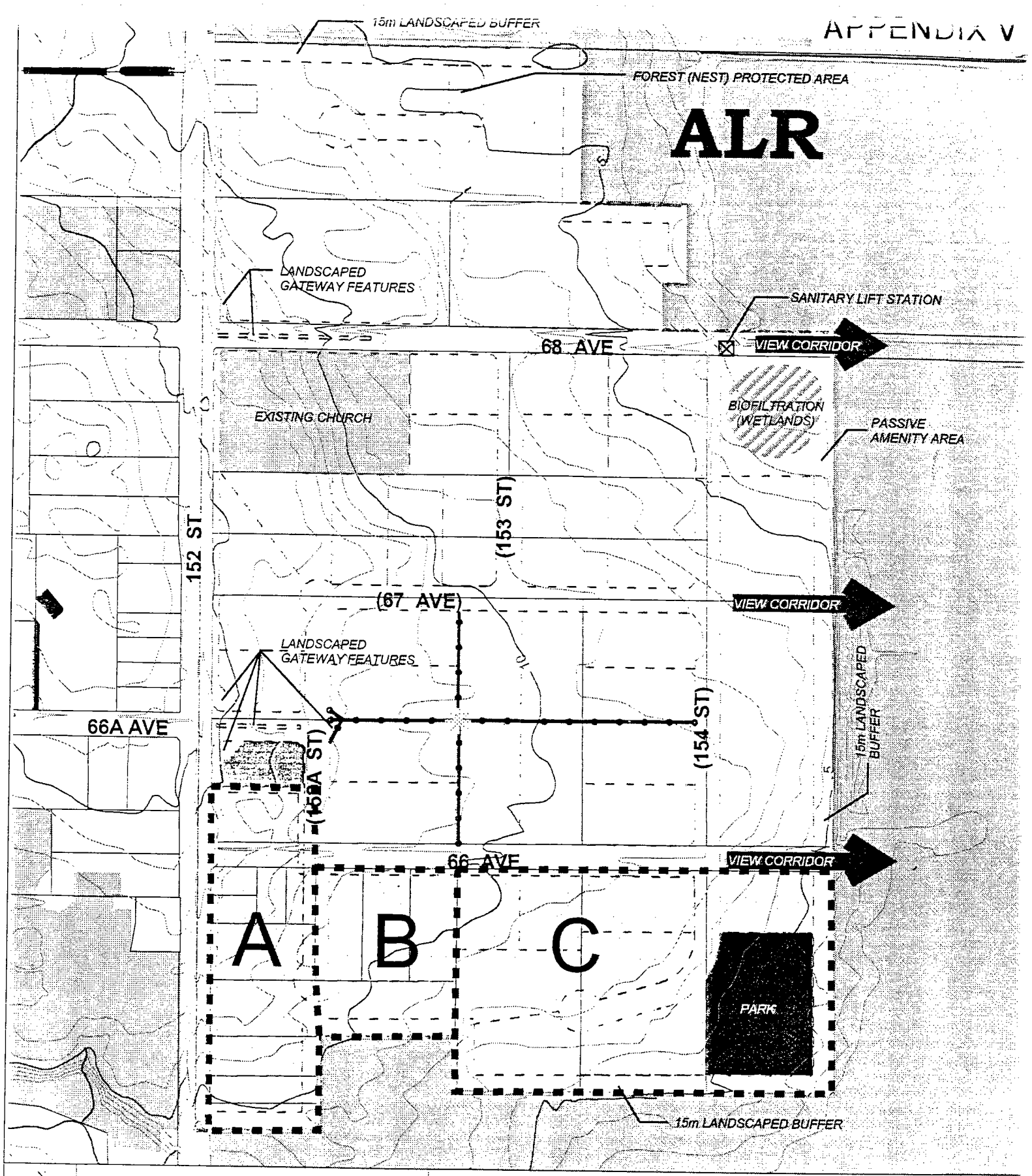
V:\DRAFTING\ArcView Mapping Projects\East Newton\East Newton Business Park\EastNewtonBusinessPark.apr (ConceptA4b)


APPENDIX II
EAST NEWTON CONTEXT MA
East Newton North
East Newton South
East Newton Business Park
South Newton
72 AVE
68 AVE
66 AVE
64 AVE
60 AVE
144 ST
146 ST
148 ST
150 ST
152 ST

APPENDIX III OCP DESIGNATIONS




80 Ave.
76 Ave.
72 Ave.
68 Ave.
GUILDFORD GOLF COURSE
BEAR CREEK
NCP
T.E. SCOTT EL. SCH.
CEMETERY
NCP
NCP (mx)
LOCAL AREA PLAN
1 Ac. Suburban Single Family Residential
1/2 Ac. Suburban Single Family Residential (gross density may be applied)
Urban Single Family Residential (gross density may be applied)
Cluster Housing (Single Family / Duplex) Maximum density: 10 units/ac.
Medium Density Multi Family Residential (Twnhse) Max. density: 15 units/ac.
Local Commercial
Commercial / Residential Mixed Use
Business Park
Industrial
Institutional (Religious Assemblies, Cemetery, etc.)
School
Institutional / Residential
Park & Open Space
Golf Course
Agricultural
Arterial Road
Collector Road
Local Road
Pedestrian / Bike Path



Property Grouping for Development
South of 66 Avenue
Optional Business Park or Live/Work Area

City of Surrey Planning & Development Department

30 0 30 60 Meters

Date: March 3, 1999

LEGEND

- East Newton Business Park NCP Boundary
- Buffers / Natural Areas
- Business Park
- Local Commercial
- Existing Church
- Park
- Live & Work (or future business park)
- Agricultural Land Reserve
- Biofiltration (wetland) Facility
- Proposed Roads & Lots
- Contours 1m
- Contours 5m
- Landscaped Pathways (private property)
- Possible Small Urban Plaza (privately owned)

APPENDIX VI

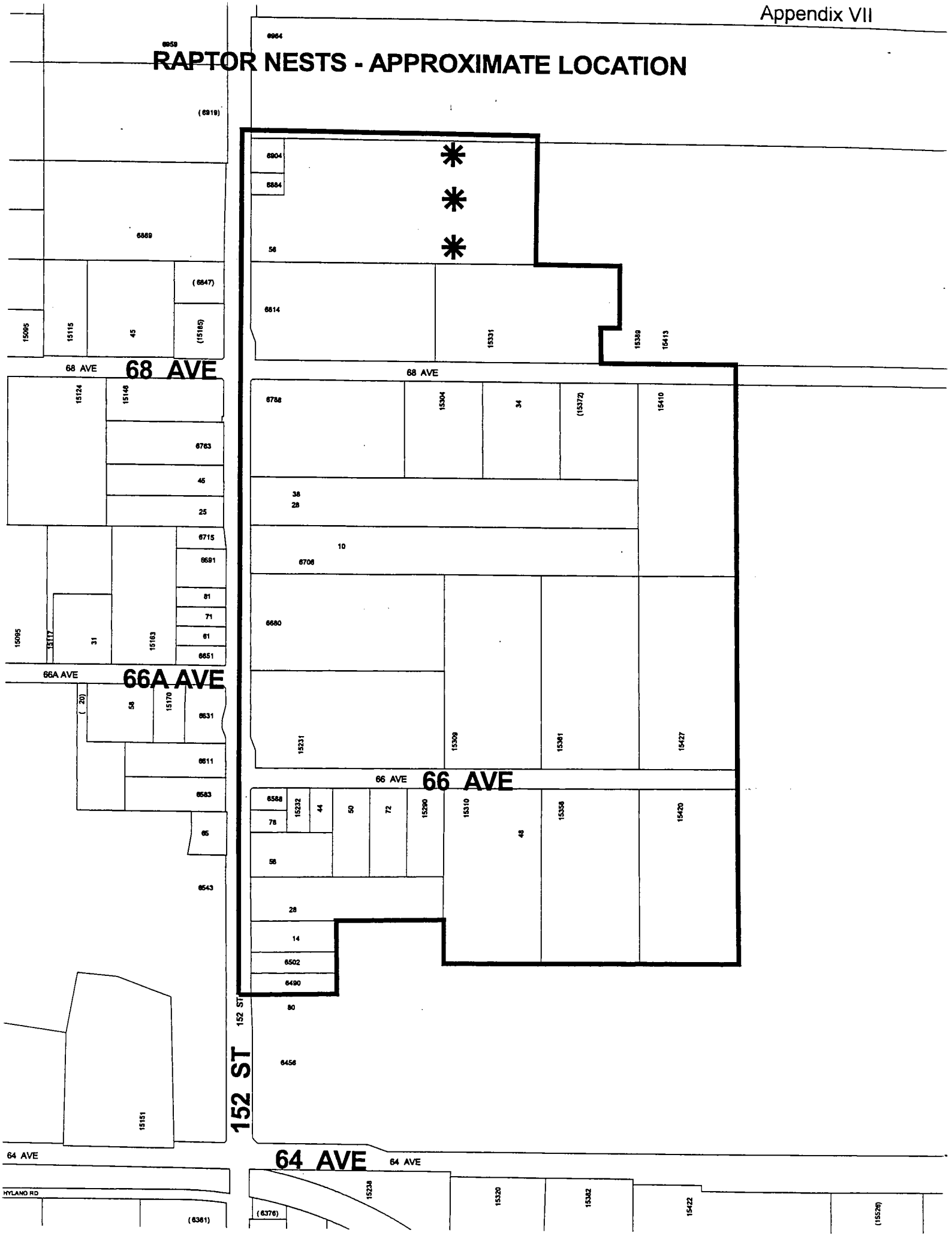
EAST NEWTON BUSINESS PARK & LIVE/WORK AREA LAND USE STATISTICS

EAST NEWTON BUSINESS PARK AND LIVE/WORK AREA LAND USE STATISTICS				
Land Use	**Area (approx.)**	**Projected Floor Area (Business)[2]**	**Projected Number of Dwelling Units**	**Projected No. of Jobs [3]**
Business Park	22.5 ha. 55.6 acres	112,500 sq. m. 1,210,980 sq.ft.	N/A	3,089
Live/Work	5.91 ha. 14.6 acres	29,550 sq. m. 318,084 sq. ft.	117	175
Park	1.94 ha. 4.8 acres	N/A	N/A	N/A
Neighbourhood Commercial	0.3 ha. 0.77 acres	1,500 sq. m. 16,146 sq. ft.	N/A	7
Existing Church	1.4 ha. 3.48 acres	N/A	N/A	N/A
Bio-filtration Pond	0.93 ha. 2.3 acres	N/A	N/A	N/A
Roads	4.94 ha. 12.2 acres	N/A	N/A	N/A
TOTALS	**38 hectares 94 acres**	**129,879 sq.m. 1,398,052 sq.ft.**	**112**	**3,271**

[2] Projected floor area is based upon an estimated 0.5 FAR.

[3] Projected number of jobs is based upon one employee per 250 square feet (50% office) and 24 employees per acre (50% light industrial). Live/work employment is based upon 1.5 jobs per unit.

RAPTOR NESTS - APPROXIMATE LOCATION



APPENDIX VIII

ENVIRONMENTAL LETTERS/CONDITIONS

BRITISH COLUMBIA

Your File: 97058
Our File: 48510-20/99.22.001

March 10, 1999

City of Surrey
Planning & Development Department
1425 - 56 Avenue
Surrey, B.C.
V3X 3A2

WWW 2350-003/3
xc: NL
EE
ENG. DEPT. ND

Dear Ms. Whelen:

Re: East Newton Business Park Neighbourhood Concept Plan

I have reviewed the correspondence and site plans associated with the above noted planning proposal, and have a number of comments regarding the potential environmental impact this project may have on existing fish and wildlife habitat.

With regard to the existing watercourses; I agree with the majority of the watercourse re-classification scheme suggested by Envirowest, as detailed in the letter from I. Whyte to L. Robertson dated Jan. 14, 1999, with the exception that the 'B' classification given to the roadside ditch on the south side of 68 Avenue should extend further west. The reason for this being that this channel carries water during periods of no precipitation, and contains vegetation that acts to contribute nutrient and improve water quality. The remaining reaches of both channels (north and south side of 68 Ave.) should retain an A(O) classification since they can potentially be used by overwintering salmonids with improvement to access (flap gate on existing culvert). This is as indicated in Table 1, and not as Class A watercourses as indicated in Attachment B of the same document. These areas would be subject to compensation requirements should channel upgrading and/or removal be approved to facilitate adjacent land development. The wetland/biofiltration structure proposed at the end of 68 Avenue may provide an opportunity for some compensation, but this will be dependent upon the extent of existing habitat loss and final design specifications.

Ministry of Environment, Lands and Parks

Environment and Lands
Lower Mainland Region

Mailing/Location Address:
10470 152 Street
SURREY BC V3R 0Y3

Telephone: (604) 582-5200
Facsimile: (604) 930-7119

The wildlife habitat values in this area will undoubtedly be severely degraded by the development as presently proposed. The upland field and woodland habitats present are almost certainly utilized by a number of bird and small mammal species, and there is no feasible way of incorporating these habitat features into the finished development. This is mitigated to some extent by the existence of similar habitats in the adjacent agricultural land. There is also a significant wood lot present on the northern boundary of the development site which presently supports nesting pairs of raptors. The ministry strongly suggests that these nesting areas be preserved, and the land use around these trees be modified to accommodate their wildlife habitat values. For more information please refer to the letter from T. Plath to L. Robertson, dated Jan. 27, 1999 which addresses this issue in depth.

Yours truly,

Miles Stratholt, M.Sc.
Habitat Officer

/ms

cc: Dave Nanson, Habitat Biologist, DFO

BRITISH COLUMBIA

Your File: 97058
Our File:

January 27, 1999

Mr. Len Robertson
Aplin & Martin Consultants Ltd.
Suite 291, 12448 - 82nd Avenue
Surrey, BC
V3W 3E9

Dear : Mr. Robertson

Re: East Newton Business Park - Neighbourhood Concept Plan (NCP)

BC Environment has assessed the site and offers the following comments. The NCP area includes a mature deciduous woodlot with nesting red-tailed hawks. Adjacency with ALR lands combined with suitable nest trees provide an excellent long term location for nesting raptors - specifically red-tailed hawk, Cooper's hawk and great horned owl. Foraging habitat in the immediate vicinity of the nest has made this nest site highly productive in past years, with 2-3 fledged young produced in most of the 10+ years this site has been used.

Although the plan provides a small protected area for the nest, the site will experience a high degree of disturbance on three sides unless a larger buffer is established. BC Environment can not approve a plan that would jeopardize the integrity of this productive nest site. BC Environment requests a minimum 50 meter (variable) buffer from the edge of all nest trees (including alternate nest sites). Due to the nest's close proximity to ALR lands BC Environment considers this a "high" priority site for protection. This area should be protected by a conservation covenant to ensure long-term protection. BC Environment look forward to cooperatively work in developing a plan that will provide a reasonably high likelihood that the nest site will continue to be viable.

Yours truly,

Thomas Plath, Wildlife Technician

cc: Miles Stratholt, Habitat Protection Officer, BC Environment
Ms. Wendy Whelen, City of Surrey

Ministry of Environment, Lands and Parks

Environment and Lands
Lower Mainland Region

Mailing/Location Address:
10470 152 Street
SURREY BC V3R 0Y3

Telephone: (604) 582-5200
Facsimile: (604) 930-7119

APLIN & MARTIN
CONSULTANTS LTD

Principals:
Robert McCurdy, PEng
Ed Fujii, PEng
Ray Janzen, BCLS
Arnold Badke, PEng
Jim Tapp, PEng
Bill Lee, PEng
Andrew Baker, PEng

January 18, 1999

Our File: 97058

Ministry of Environment
Planning & Assessment
Lower Mainland Region
10470-152 Street
Surrey, BC V3R 0R3

WLW ~~BK~~ 2350-003/3

Attention: **Mr. Miles Stratholt**

Dear Sirs:

Re: **East Newton Business Park – Neighbourhood Concept Plan (NCP)**

We are currently in the early stages of finalizing the East Newton Business Park (NCP) for the City of Surrey. In the course of the review of our draft report, the City of Surrey Planning Department and Engineering Departments have requested that we ask for your comments on the proposed Neighbourhood Concept Plan.

We are enclosing a copy of the Surrey Planning Departments proposed zoning plan, a copy of the proposed storm sewer plan (Figure 10) and a copy of Envirowest Consultants Ltd. report on their field assessment on all the watercourses within the proposed business park for your review and comments.

The business park will consist of light industrial land as shown in pink, a live and work land use south of 66 Avenue and a small commercial lot. The NCP study area will drain via storm sewer collection system to the east end of 68 Avenue within the study area. A biofiltration pond will be eventually designed by an environmental consultant to receive the first flush of the storm events and then flow into the two large ditches along 68 Avenue east of the study area. These two ditches drain eventually into the Serpentine River.

At the next regular scheduled meeting with the City of Surrey on January 27, we and Envirowest Consultants Ltd. will make an oral presentation to you on the Neighbourhood Concept Plan. We would be pleased to answer all of your questions at the above meeting.

Yours truly,

APLIN & MARTIN CONSULTANTS LTD.

L. B. Robertson, PEng
Project Engineer

LBR:ct

Enclosure

cc: Ms. Wendy Whelen, City of Surrey
Eric Emery, MBA, PEng, Drainage Planning Manager, City of Surrey
John Sidnell, PEng, NCP Project Coordinator, Reid Crowther & Partners Ltd.

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envirowest
ENVIRONMENTAL CONSULTANTS

January 14, 1999

Aplin & Martin Consultants Ltd.
Suite 201, 12448 - 82nd Avenue
Surrey, B.C.
V3W 3E9

Attention: Mr. Len Robertson, P.Eng.
Project Engineer

Dear Mr. Robertson,

RE: EAST NEWTON BUSINESS PARK - NCP
WATERCOURSE CLASSIFICATIONS

Envirowest has conducted a field assessment of all watercourses within the proposed business park. The purpose of the assessment was to confirm or, where necessary, revise the current classifications as shown on the City of Surrey Watercourse Classification Map. Our findings are described below.

The current watercourse classification map indicates that the business park area includes streams of classes A(O) and C only. As revised, the map should include streams of classes A(O), B and C. Some mapped watercourses do not exist. Our findings are summarized in Table 1 below.

With development of the business park it is expected that all of the Class C watercourses and some portions of the Class B watercourses will be eliminated. Class C watercourses, by the definition adopted by the City of Surrey and the environmental agencies, have insignificant habitat value and can be displaced without compensation. Class B watercourses, by definition, are not inhabited by salmonids but do provide food/nutrient value to downstream habitats. While the habitat value of Class B watercourses should be preserved, some distinction should be made between Class B habitats that cannot feasibly be re-created (such as ephemeral headwater ravines) and those that can feasibly be re-created. The Class B habitats within the study area are all manmade ditches/swales that were dry when assessed in the fall of 1998. These include the following watercourse sections:

- 66th Avenue, south side, easternmost 60 m;
- 66th Avenue, north side, easternmost 75 m;
- 68th Avenue, south side, easternmost 75 m (to study area boundary);
- south of 68th Avenue, 15250 block;
- 6750 block, 15250 to 15350 blocks; and,
- north of 68th Avenue, 15250 block.

ECL ENVIROWEST CONSULTANTS LIMITED
Suite 204 - 800 McBride Blvd.
New Westminster, B.C. V3L 2B8
phone: (604) 521-6500
fax: (604) 521-2208
ecl@axionet.com

Table 1. Watercourse classifications for the East Newton Business Park.

LOCATION	PHOTO NUMBERS	CURRENT CLASSIFICATION	REVISED CLASSIFICATION
66th Avenue - south side	1 - 2	Class C - all 500 m	Class C - western 440 m Class B - eastern 60 m
66th Avenue - north side	3 - 4	Class C - western 200 m Class A(O) - eastern 300 m	Class C - western 425 m Class B - eastern 75 m
North of 66th Avenue at 15350 block	5	Class A(O)	Does not exist
66th Avenue to 68th Avenue at 15450 block	6	Class A(O)	Class B
68th Avenue - south side	7 - 8	Class A(O)	Class C - western 275 m Class B - middle 75 m Class A(O) - east of study area
68th Avenue - north side	9 - 10	Class A(O)	Class C - western 300 m Class A(O) - eastern 75 m and beyond study area
South of 68th Avenue at 15400 block	11	Class A(O)	Does not exist
South of 68th Avenue at 15250 block	12	Class A(O)	Class B
6750 block between 15250 and 15350 blocks	13	Class A(O)	Class B
North of 68th Avenue at 15300 block	14	Class A(O)	Does not exist
North of 68th Avenue at 15250 block	15	Class A(O)	Class B

The proposed wetland to be constructed at the northeast corner of the study area will accommodate sufficient habitat features to offset the loss of these Class B habitats. The proposed wetland/pond will provide sedimentation and biofiltration functions primarily within about one-half of the area, with food/nutrient production and wildlife habitat within the other half. The lands surrounding the wetland/pond would be landscaped to maximize fish and wildlife values.

Upgrading of the Class A(O) watercourse east of the study area (along the 68th Avenue right-of-way) is anticipated. This will require impact mitigation that may also include compensation habitat.

Attachments A and B show the existing and revised watercourse maps. Pending approval and development of the business park, the watercourse map will require further updating to reflect the ultimate drainage configuration.

Photographs referred to in Table 1 are presented in Attachment C.

Please note that, under the terms of the Memorandum of Agreement regarding the watercourse classification system, revisions to the current watercourse classifications require the endorsement of the Ministry of Environment, Lands and Parks and the Department of Fisheries and Oceans. Please call me should you have questions.

Yours truly,
ECL ENVIROWEST CONSULTANTS LIMITED

Ian W. Whyte
Senior Project Manager

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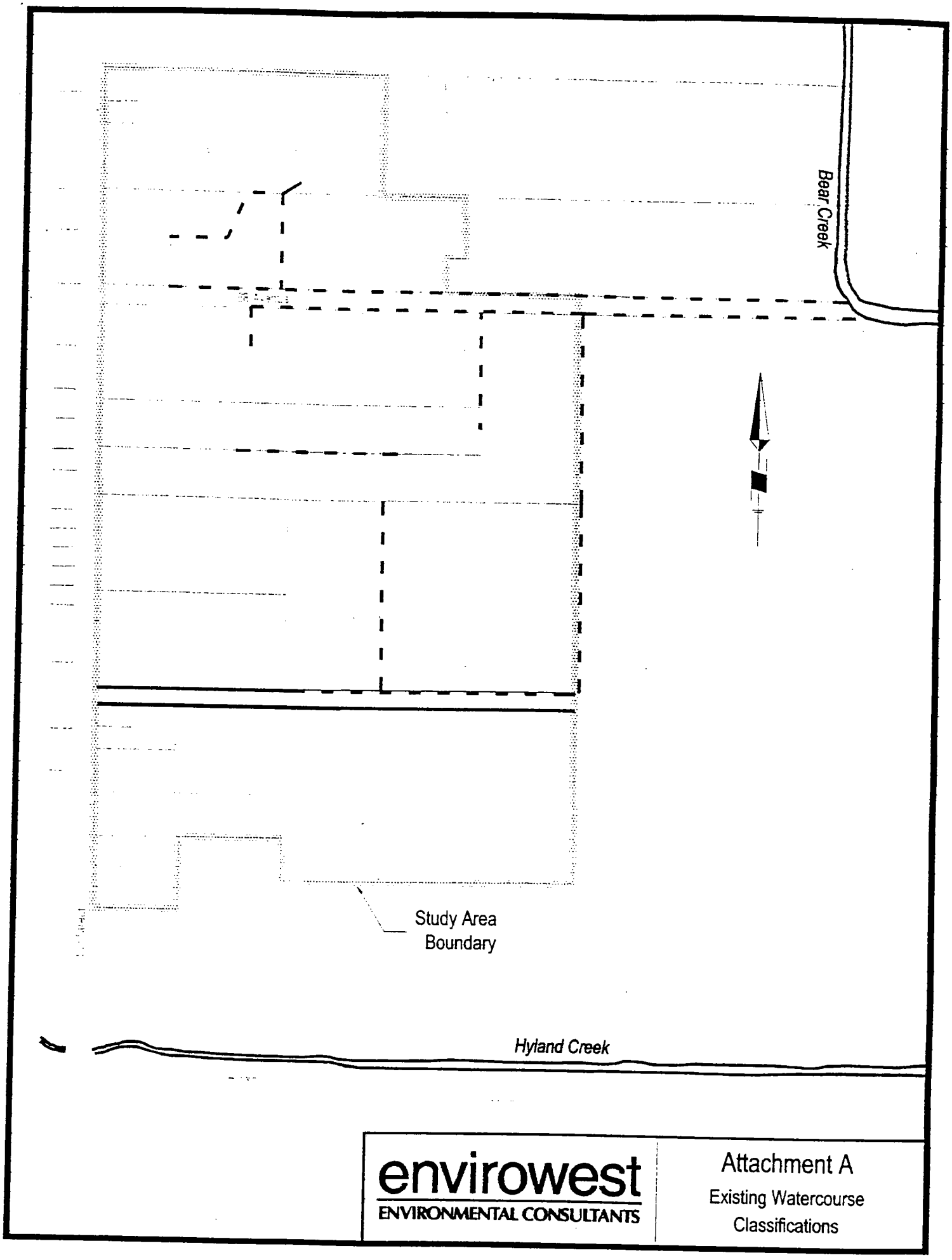
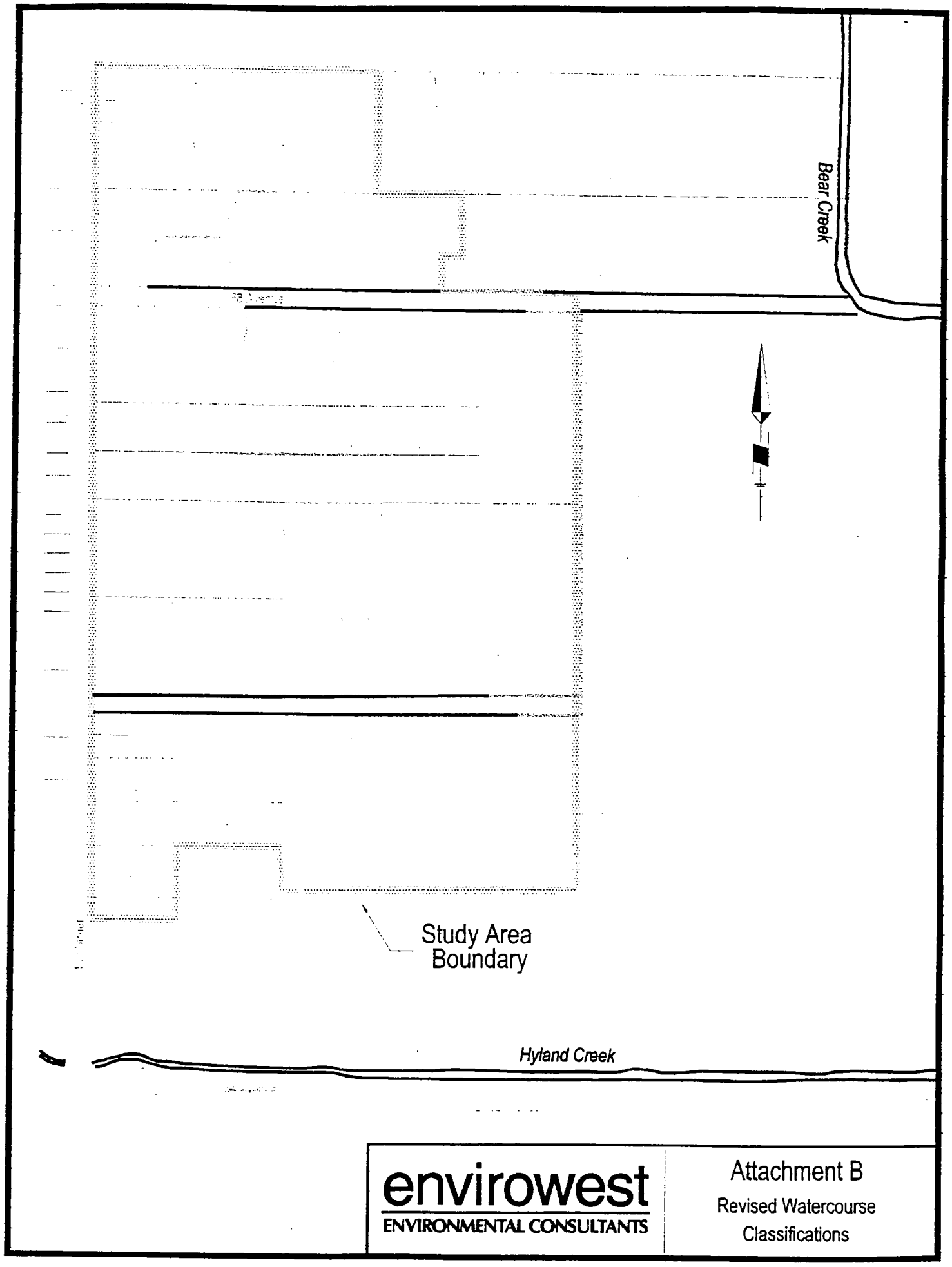


envirowest
ENVIRONMENTAL CONSULTANTS

Attachment A
Existing Watercourse
Classifications



envirowest
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Attachment B
Revised Watercourse
Classifications

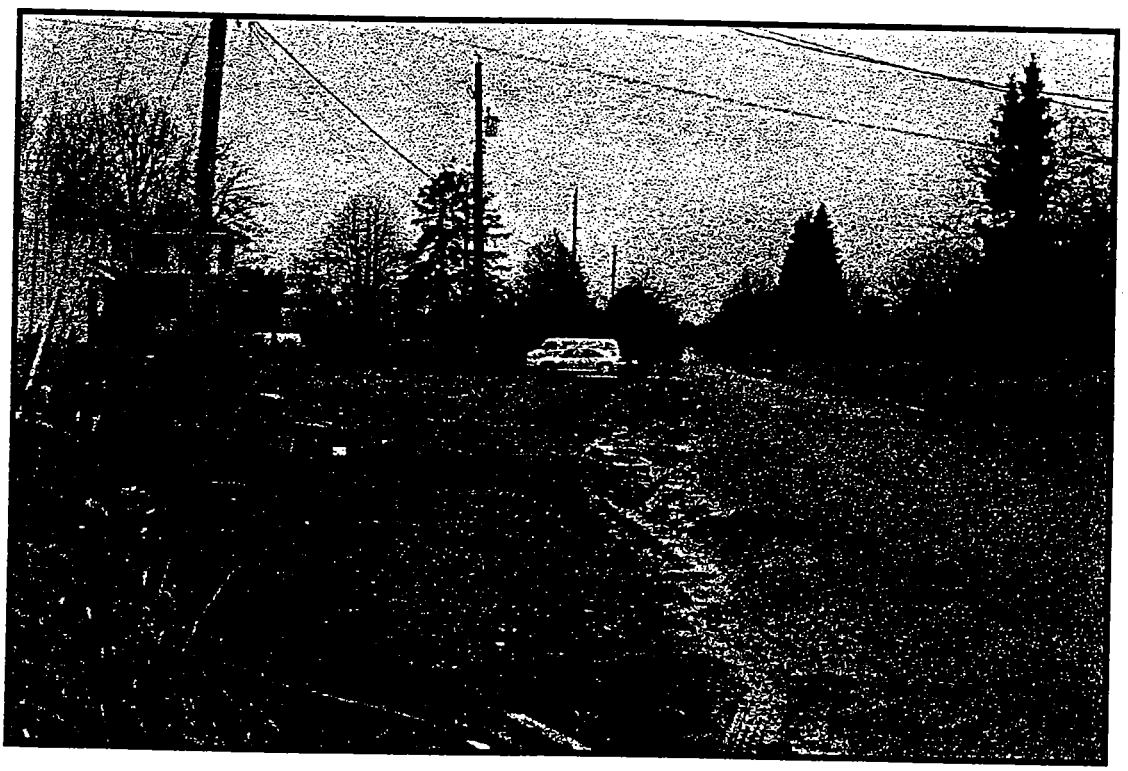
Photograph 1. Ditch on south side of 66th Avenue, looking west (Class C).

Photograph 2. Ditch on south side of 66th Avenue near east boundary of study area. Beyond driveway ditch is Class B.

Photograph 3. Ditch on north side of 66th Avenue, looking west (Class C).

Photograph 4. Ditch on north side of 66th Avenue near east boundary of study area. This portion is Class B.

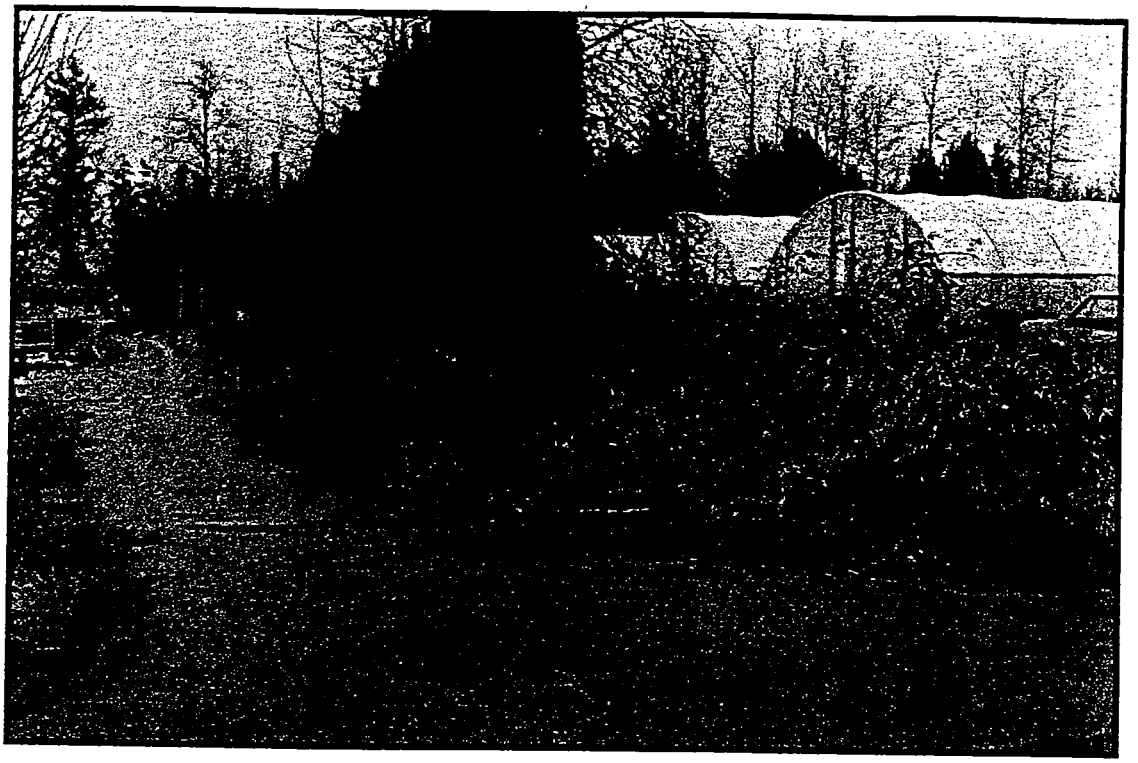
Photograph 7. Ditch on south side of 68th Avenue, looking east. Class B in foreground; Class A(0) in background (beyond eastern boundary of study area).



Photograph 8. Looking west along south side of 68th Avenue (Class C).

Photograph 9. Looking east along north side of 68th Avenue near eastern boundary of study area (Class A(0)).

Photograph 10. Looking west along north side of 68th Avenue (Class C).



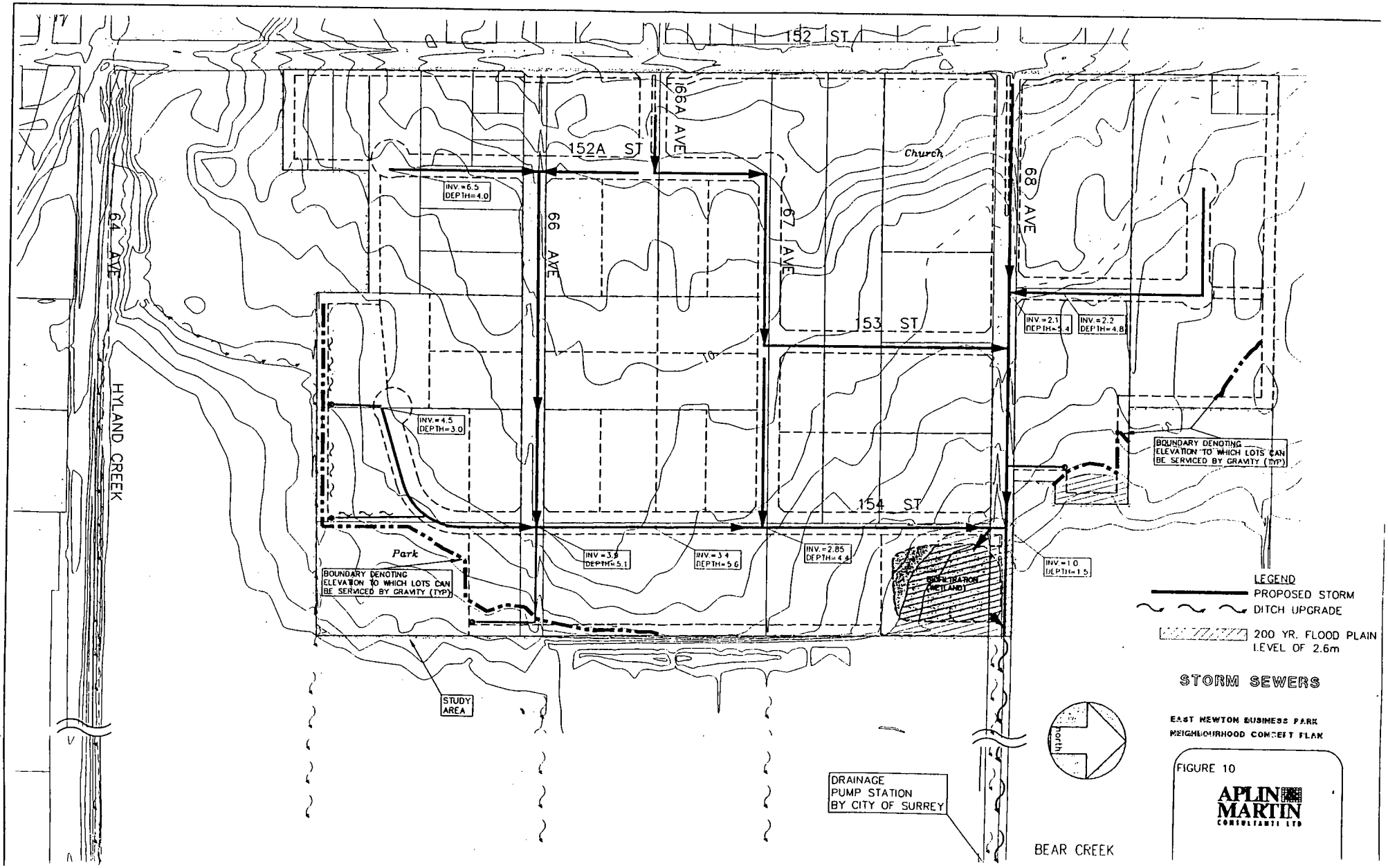
Photograph 11. Property boundary south of 68th Avenue where current map shows a watercourse (that does not exist).

Photograph 12. Minor ditch along property boundary, south of 68th Avenue (Class B). Dry detention basin on right side of photograph.

Photograph 13. Swale oriented eastward at south side of lots on south side of 68th Avenue (Class B).

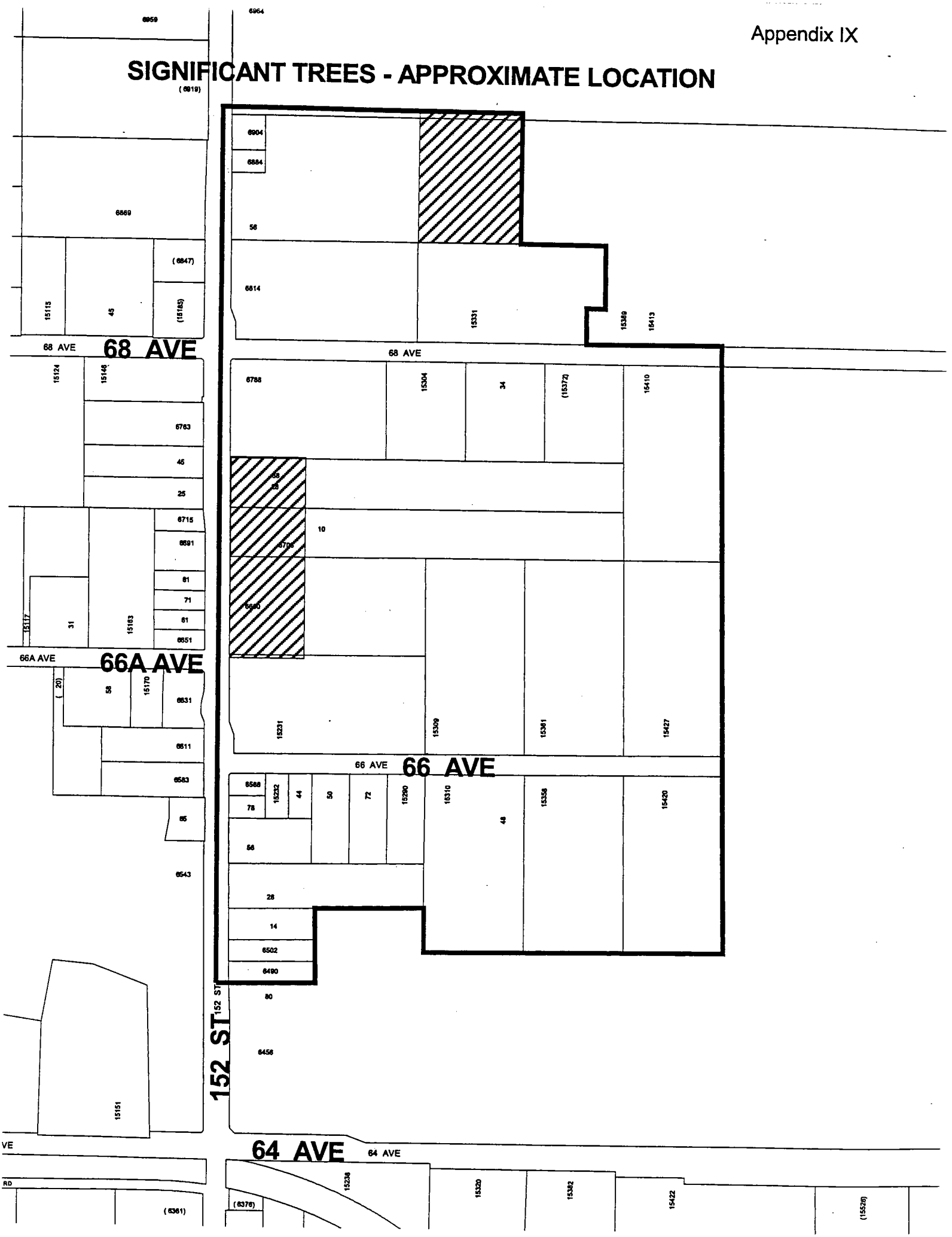
Photograph 14. Looking north from 68th Avenue along property boundary where current map shows a watercourse (that does not exist).

Photograph 15. Looking east at swale through farm (Class B).


152 ST
152A ST
153 ST
154 ST
66A AVE
64 AVE
66 AVE
67 AVE
68 AVE
HYLAND CREEK
Church
Park
INV.=6.5
DEPTH=4.0
INV.=4.5
DEPTH=3.0
INV.=3.9
DEPTH=5.1
INV.=3.4
DEPTH=5.6
INV.=2.85
DEPTH=4.4
INV.=2.1
DEPTH=3.4
INV.=2.2
DEPTH=4.8
INV.=1.0
DEPTH=1.5
BOUNDARY DENOTING ELEVATION TO WHICH LOTS CAN BE SERVICED BY GRAVITY (TYP)
BOUNDARY DENOTING ELEVATION TO WHICH LOTS CAN BE SERVICED BY GRAVITY (TYP)
EXCAVATION (WETLAND)
STUDY AREA
DRAINAGE PUMP STATION BY CITY OF SURREY
BEAR CREEK
North
LEGEND
PROPOSED STORM
DITCH UPGRADE
200 YR. FLOOD PLAIN LEVEL OF 2.6m
STORM SEWERS
EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN
FIGURE 10
APLIN MARTIN CONSULTANTS LTD

Appendix IX

SIGNIFICANT TREES - APPROXIMATE LOCATION



APPENDIX X

DESIGN GUIDELINES FOR THE EAST NEWTON BUSINESS PARK

The following design guidelines will apply to developments within the East Newton Business Park Neighbourhood Concept Plan area. These guidelines are intended to complement the Development Permit Guidelines contained in Surrey's Official Community Plan (OCP) and the Provincial Agricultural Land Commission's *Landscape Buffer Specifications, 1993.* Development Permits will be required for all developments to ensure compliance with these, and the above mentioned guidelines.

1. Objectives

1.1. To encourage the development of a comprehensively designed Business Park in an open space/campus-like setting.
1.2. To achieve a high level of visual identity for the Business Park.
1.3. To facilitate the co-ordinated development between buildings, landscaping and site features.
1.4. To enhance the interface between Business Park and Live/Work developments.
1.5. To enhance the interface between the Business Park and the Agricultural Land Reserve.
1.6. To maintain as much of the natural environment as possible.

2. General Guidelines

2.1. Compatibility of the building design (scale, massing, material) with the architecture of adjacent buildings is recommended.
2.2. To provide visual landmarks, and to promote a sense of enclosure, the principal building of a corner property should be located so as to anchor the corner, and be designed to be visually attractive from both abutting streets.
2.3. A consistently maintained wide front yard landscaped setback of not less than 7.5 metres to parking areas and/or to buildings must be established on all sites, regardless of the use or character.
2.4. A row of alternating trees along the street to complement the street trees must be planted within the lot to achieve a canopy effect over the sidewalk.
2.5. Landscaped screening must be provided for all mechanical, electrical equipment, garbage collection areas, large paved parking areas, blank walls, fences, and loading areas that are visible from the street.
2.6. Parking within the front yard setback is discouraged, however, where it is proposed, it must be visually screened from the street by a combination of berming and high quality landscaping.
2.7. All planting material must conform to the Official Community Plan guidelines for Landscaping and Fences, Section A.6.

2.8. In general, fences along property lines that abut streets will not be permitted. A fence may be permitted provided that the fence is set back the same distance as the principal building and substantial landscaping is provided on the street side of the fence.

3. Streetscape Guidelines for 152 Street

3.1. Buildings along 152 Street should be designed to include glazing as a major component.
3.2. Loading bays/overhead garage doors will not be permitted to face 152 Street.
3.3. No parking or vehicle laneways within the required 152 Street setback will be permitted towards the street.
3.4. A consistently maintained 7.5 metre wide high quality landscaped frontage is required.
3.5. No free-standing signs will be permitted along the 152 Street frontage.
3.6. Fascia signs facing the street may be permitted provided they are integrated and/or co-ordinated with the architecture of the buildings.
3.7. Architectural compatibility (scale, massing, finishing materials) between buildings is highly recommended.
3.8. The 5 metre-wide buffer along 152 Street must be planted with high quality landscaping material. Planting material must conform to the Official Community Plan guidelines.

4. Streetscape Guidelines for Internal Roads

4.1. The use of glass and high quality finishing materials recommended.
4.2. A consistently maintained high quality landscape frontage is required.
4.3. Signage should be architecturally co-ordinated with the overall design of the building.
4.4. Service doors (e.g. an overhead door at a loading dock) and overhead garage doors should not be located towards the street.
4.5. Free standing signs should be integrated into the landscaping and be designed in a similar style to the architecture of the buildings. Single pole pylon signs are not permitted.
4.6. The maximum height of any free-standing sign is 2.4 metres (8 feet).
4.7. On corner sites, the principal building should be located at the corner and designed to be visually attractive from both abutting streets.
4.8. Compatibility of the building design with architecture of adjacent buildings must be considered.
4.9. For consistency from development to development, the type of lamp, its height, intensity intervals, etc., will be co-ordinated by Engineering through the servicing agreement process.

5. Guidelines for the 15-metre Buffer Between the Business Park and the Agricultural Land Reserve

5.1. The buffer will be developed according to the *Schedule A: Buffer Types*, A:3 *Airborne Particle and Visual Screen* of the Landscaped Buffer Specifications of the B.C. Agricultural Land Commission.

6. Interface between the Business Park and the Live/Work Area

6.1. A minimum 5-metre landscaped buffer is required between the Business Park/Commercial area and the Live/Work area.

6.2. A combination of a mound and high quality landscaping is required for this 5-metre buffer.

6.3. A double row of alternating trees should be planted to achieve a canopy effect over the sidewalk along the south side of 66 Avenue and the east side of 152 A Street (north of 66 Avenue).

6.4. Pedestrian-scale lighting is recommended for the sidewalk along the south side of 66 Avenue and the east side of 152A Street (north of 66 Avenue).

7. Guidelines for Gateways, View Corridors, Urban Plaza, Open Space and Tree Preservation

7.1. Gateways

7.1.1. Gateway features must be developed in the locations depicted in the Neighbourhood Concept Plan.

7.1.2. Gateway features should incorporate unique lighting standards and landscaped medians.

7.1.3. These gateways must be developed with high quality soft and hard landscaping.

7.1.4. Main entry signs or major business park identification signs should be of high quality, durable material, co-ordinated with the architecture of the Business Park.

7.1.5. The entry signs should make provision for identifying the individual businesses located in the Business Park.

7.2. View Corridors

7.2.1. No buildings or structures will be permitted within the three view corridors identified on the Plan.

7.2.2. The width of these view corridors will be the same width as the right-of-way width of 66 Avenue, 67 Avenue, and 68 Avenue.

7.3. Urban Plaza (privately owned)

7.3.1. The small plaza should be developed to provide for outdoor amenity space and the enjoyment of the Business Park users.
7.3.2. It should include lighting, seating, and good quality landscaping.
7.3.3. This plaza should be integrated to the public street sidewalk system by pedestrian walkways.
7.3.4. Crime prevention measures should be used in the design of this plaza.

7.4. Park

7.4.1. Picnic tables will be provided adjacent to the road on the higher elevations.
7.4.2. Benches will be provided and pedestrian paths will be developed.
7.4.3. A small playground will be developed to serve the children living in the live/work area.

7.5. Bio-filtration Facility (Wetland)

7.5.1. The edge of the bio-filtration facility at the north east corner of the Business Park will be developed to allow passive recreation opportunities near its edge.

7.6. Tree Preservation

7.6.1. The large Sequoia (Giant Red Wood) trees near 152 Street south of 168 Street (see location map in Appendix IX) should be preserved and incorporated into the site design of development proposals.
7.6.2. The wood lot located in the north east corner of the Business Park should be considered for retention in connection with the development of the larger property.

APPENDIX XI

PRELIMINARY DESIGN GUIDELINES FOR LIVE/WORK DEVELOPMENTS

Defining the Concept of Live/Work Developments

Specific densities and forms of the live/work developments proposed in East Newton will be determined in conjunction with an ensuing study of this land use to be undertaken for East Newton, Rosemary Heights and East Clayton. This type of housing/work opportunity is not currently available in Surrey and research is required to adapt this innovative product to the conditions in East Newton.

These lands (located south of 66 Avenue) are intended to accommodate a new form of housing/business opportunity not currently available in Surrey. The businesses would provide services to the Business Park.

Proposed General Guidelines

1) The development should be comprehensively designed including architecturally controlled building facades, signs and landscaping.
2) The site design of the development should take into consideration mature trees, groups of trees, water courses and should be designed to maintain as much of the natural environment as possible.
3) The development projects should provide outdoor amenity space and indoor amenity space for the enjoyment of the residents.
4) The projects should also provide common space for meetings and shared support work space (i.e. copier, secretarial services).
5) Provision should be made for adequate parking to accommodate the residents and visitors/customers.
6) Visitor parking should be located so as to minimize disruption to the residents.
7) In some cases, (more research required) there may be a physical separation (with a fire wall) between the live and work spaces.
8) The entire development should be large enough for the users to share facilities and also to feel some sense of community.
9) There should be a mechanism to ensure that prospective purchasers of the units are aware of the types of uses in the development (by a covenant or signs/plagues on the buildings).
10) A business license should be required for the unit.
11) The work areas must be adequately sized and tied in tenure to the living space; dwelling use would not be permitted in the work space.
12) The units would provide functional features to accommodate businesses such as larger doors, suitable electrical, plumbing, ventilation.

13) Larger storage space for the units should be provided (either in the units or communal).
14) The buildings would resemble residential (e.g. single detached, duplex or attached groups).
15) At the time of rezoning, the City would work with the developers in defining the site layout, building designs, floor plans, parking areas, setbacks, etc.

APPENDIX XII

EAST NEWTON BUSINESS PARK AND LIVE/WORK AREA AMENITY CONTRIBUTIONS			
	Per Acre Contribution Business Park *Approx. 55 acres*	**Per Acre Contribution Live/Work Area** *Approx. 15 acres*	**Anticipated Revenue**
Police Protection	$201.60 per acre	$201.60 per acre	$14,112
Fire Protection	$870.92 per acre	$870.92 per acre	$60,964.40
Park/Pathways Development	$2,664.30 per acre	$2664.30 per acre	$186,500
Library Materials	N/A	$113.40 per unit *@ 8 units per acre*	$13,267.80
Total Contribution (per acre)	**$3,736.82 per acre**	**$3,736.82 per acre** *plus $113.40 per unit for libraries*	
Total Anticipated Revenue			

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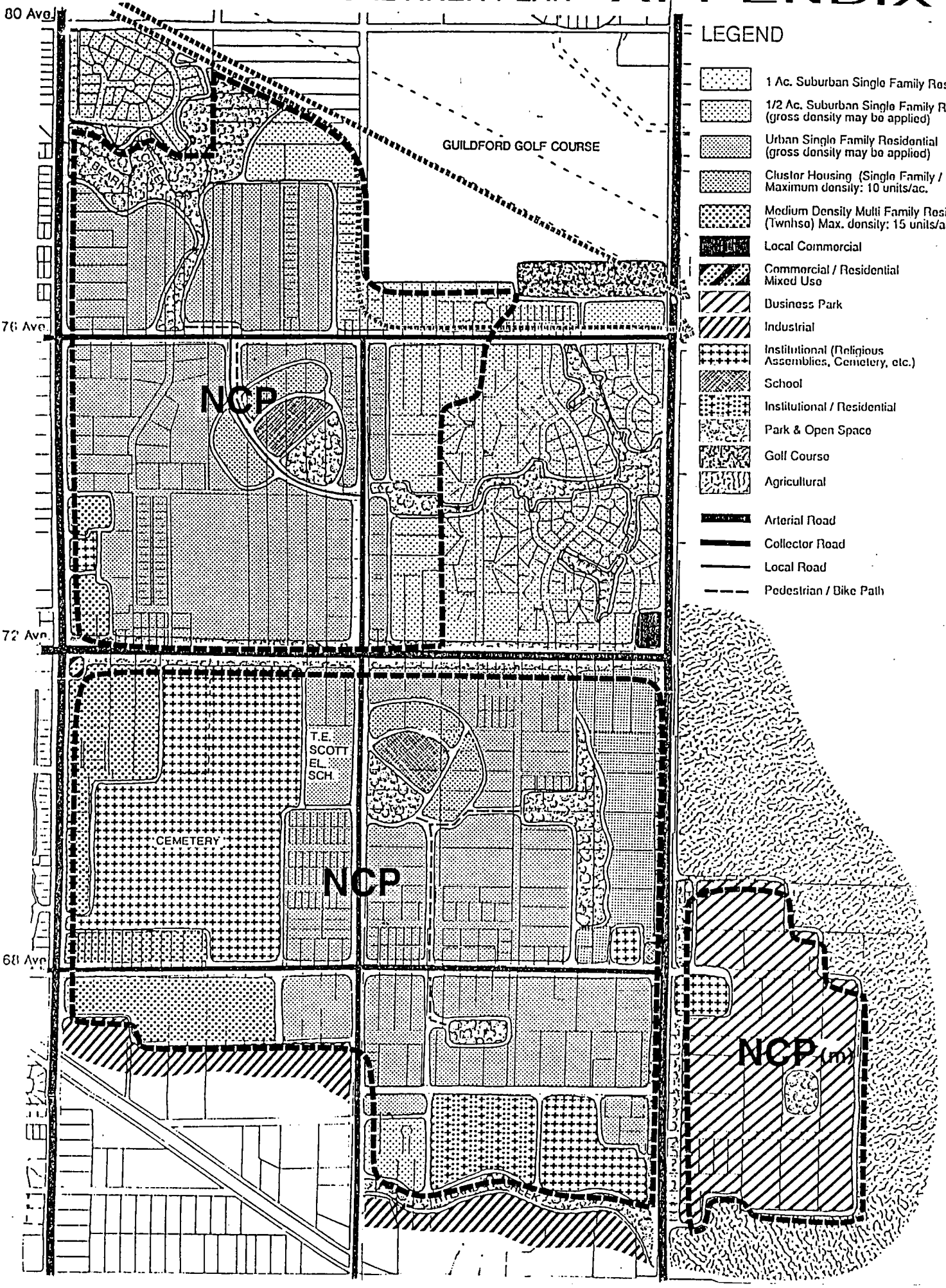
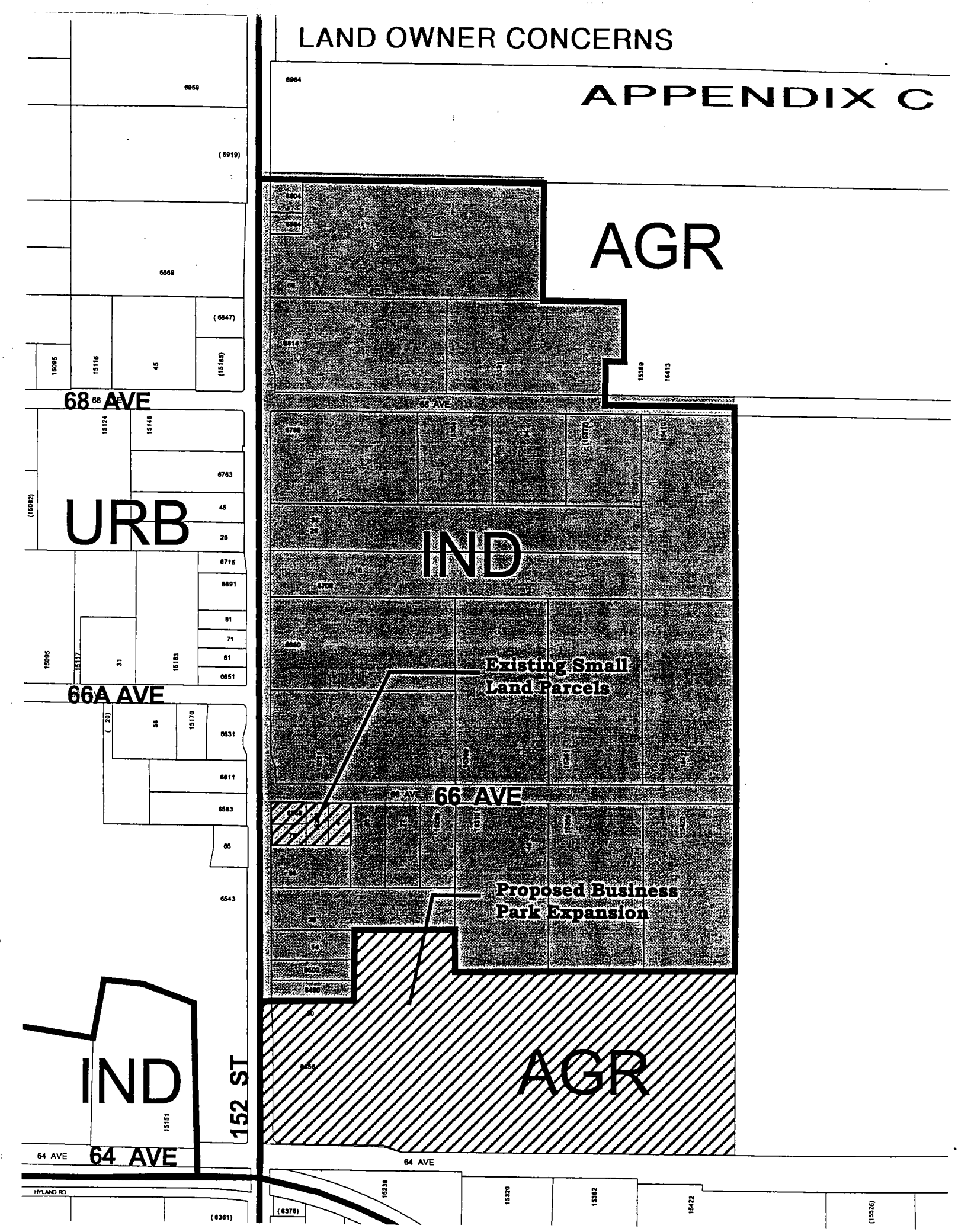
EAST NEWTON LOCAL AREA PLAN APPENDIX B




LAND OWNER CONCERNS
APPENDIX C
AGR
URB
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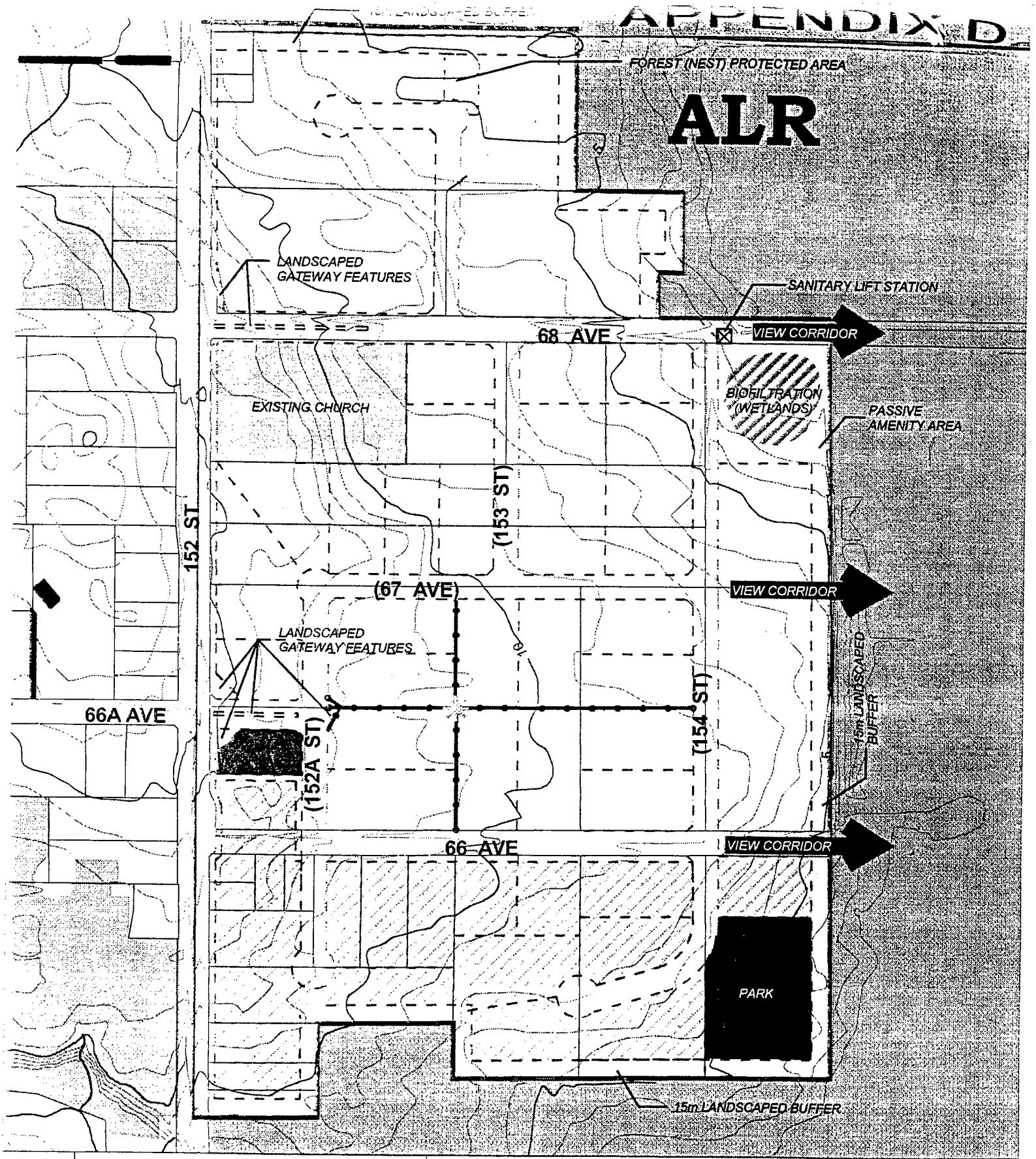
AGR
Existing Small Land Parcels
Proposed Business Park Expansion
68 AVE
66A AVE
66 AVE
64 AVE
64 AVE
64 AVE
152 ST
HYLAND RD



N

East Newton Business Park Neighbourhood Concept Plan Proposed Land Use Concept

City of Surrey Planning & Development Department

30 0 30 60 Meters

Date: March 3, 1999

Fig. 1

LEGEND

- East Newton Business Park NCP Boundary
- Buffers / Natural Areas
- Business Park
- Local Commercial
- Existing Church
- Park
- Live & Work (or future business park)
- Agricultural Land Reserve
- Biofiltration (wetland) Facility
- Proposed Roads & Lots
- Contours 1m
- Contours 5m
- Landscaped Pathways (private property)
- Possible Small Urban Plaza (privately owned)

EAST NEWTON BUSINESS PARK

NEIGHBOURHOOD CONCEPT PLAN

SURREY
CITY OF PARKS

Prepared by: Aplin & Martin Consultants Ltd.

Date: March 1999

Project No.: 97058

APLIN & MARTIN CONSULTANTS LTD

Principals:
Robert McCurdy, PEng
Ed Fujii, PEng
Ray Janzen, BCLS
Arnold Badke, PEng
Jim Tapp, PEng
Bill Lee, PEng
Andrew Baker, PEng

March 19, 1999

Our File: 97058

City of Surrey
Engineering Department
14245 - 56 Avenue
Surrey, BC V3X 3A2

Attention: Mike Darbyshire, PEng
Acting Manager, Engineering Planning

Dear Sirs:

Re: Final Report for East Newton Business Park – NCP

We are forwarding five copies of the final report for the East Newton Business Park Neighbourhood Concept Plan.

We thank you for giving us the opportunity to work with you on this exciting project.

Yours truly,

APLIN & MARTIN CONSULTANTS LTD.

L. B. Robertson, PEng
Project Engineer

LBR:lf

Enclosures

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Suite 201 - 12448 - 82nd Avenue, Surrey, BC, Canada, V3W 3E9. Tel: (604) 597 - 9058, Fax: (604) 597 - 9061, E-mail: aplin@direct.ca

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Appendix G Unit Rates for NCP Projects

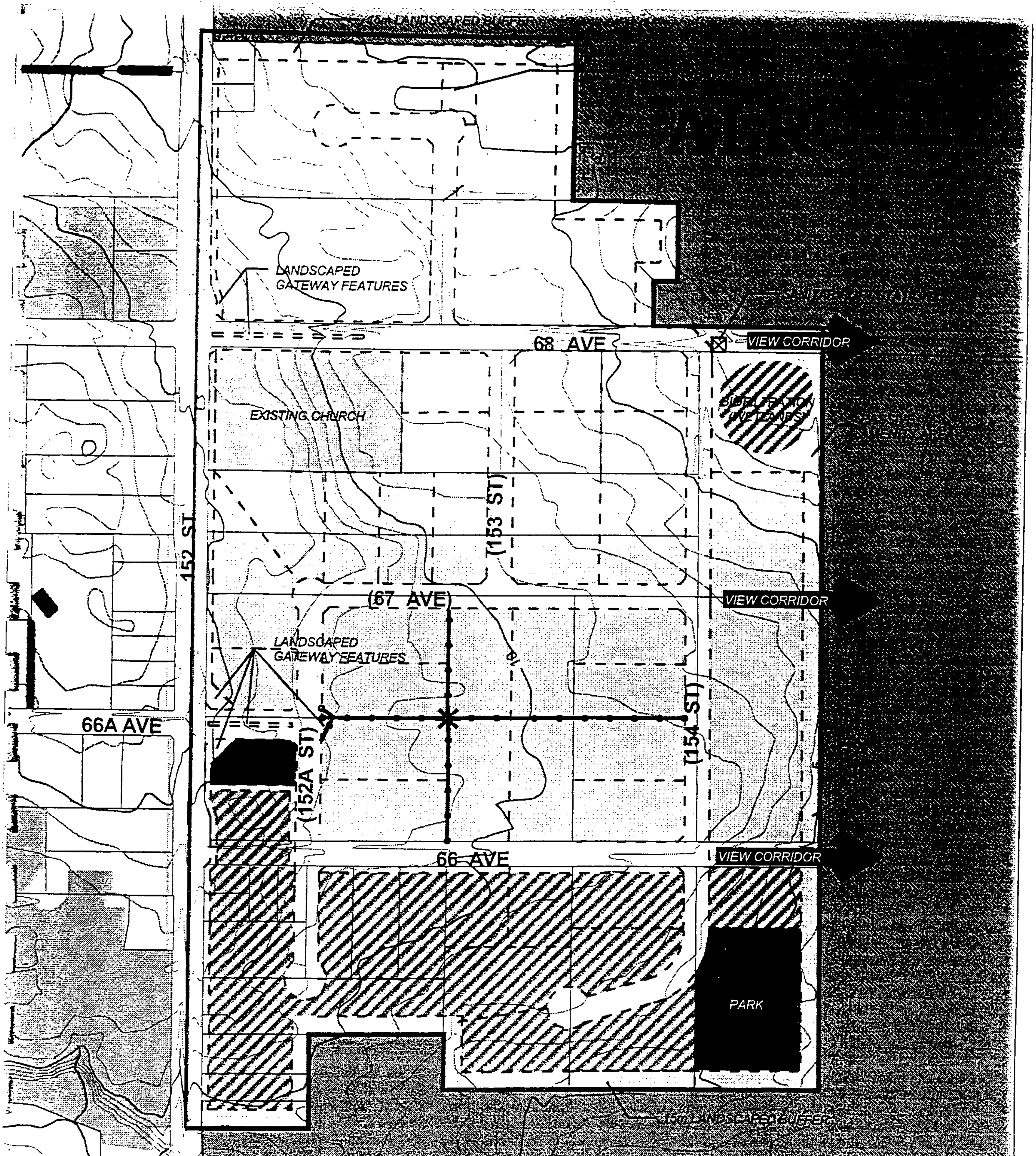
1.0 INTRODUCTION

The City of Surrey commissioned Aplin & Martin Consultants Ltd. to undertake the engineering servicing study to review constraints, and prepare options, examine financial issues and provide recommendations.

Aplin & Martin Consultants Ltd., the City of Surrey Engineering Department and Planning Department attended a series of Citizen" Advisory Committee meetings and Public meetings to listen to concerns and resolve issues. After a series of public meetings and in consultation with the public, the chosen land use plan for the NCP study area was developed and is depicted as Figure 1. This plan was used as the basis for the report.

The East Newton Business Park Neighbourhood Concept Plan (NCP) area is approximately 93 acres of land located immediately east of 152 Street at 68 Avenue. The site is surrounded by the Agricultural Land Reserve on three sides (north, east, south) with 152 Street being the west boundary and separation from the East Newton (South) NCP that is located immediately west of 152 Street.

The southerly portion of the study area has a new land use known as Live/Work. Since Live/Work land use is undefined, and with the Live/Work land use designation having the ability to revert to a business park use, this area was serviced and analysed under similar land use as a light industrial business park.



N

East Newton Business Park
Neighbourhood Concept Plan
Proposed Land Use Concept

City of Surrey Planning & Development Department

Fig. 1

30 0 30 60 Meters

Date: March 3, 1999

LEGEND

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- Proposed Roads & Lots
- Contours 1m
- Contours 5m
- Landscaped Pathways (private property)
- Possible Small Urban Plaza (privately owned)

2.0 SERVICING PLANS

2.1 TOPOGRAPHY

The site is gently sloping, with the land falling away to the east from a high point of about 15 metres at 152 Street, falling to an elevation of less than two metres at the junction of the flood plain located at the easterly boundary of the site as shown on Figure 2. 25% of the NCP area drains naturally in a south-east direction to the south-east corner of the site and the remaining 75% drains naturally in a north-easterly direction to the north-east corner of the site. Slopes are mainly less than 5%.

This NCP study area is the lowest segment of uplands drainage basin that drains into the lowlands area and surrounding Agricultural Land Reserve. The lowlands drain through the agricultural fields in ditches to the nearby Serpentine River. The topography causes a constraint on the servicing plans as the lowest points of the study area is the north-east and south-east corners. This constraint is reviewed further is the following sections.

2.2 ROADS AND TRANSIT

2.2.1 Constraints

The NCP study area is located on the east side of 152 Street which is one of the principal north/south arterial roads in Surrey, and just north of 64 Avenue, one of the principal east/west arterial roads in Surrey. This location is, therefore, ideal in terms of road access for the use of the industrial operators.

One of the difficulties with the site is that all access is to be provided via 152 Street, a roadway that is experiencing ever increasing traffic volumes. According to the 1995 traffic volume map, 152 street is carrying about 20,000 vehicles per day (vpd) and about 16,000 vpd on 64 Avenue. These traffic volumes have likely increased due to the recent completion of works on 152 Street south of 64 Avenue and on 64 Avenue on either side of 152 Street. Prior to the completion of these works, the intersection of 152 Street and 64 Avenue was one of the most congested in Surrey. The recent improvements on both 64 Avenue and on 152 Street include the provision of an additional through lane in all four directions.

In summary, the road network is able to sustain the development of the NCP provided that the Floor Area Ratio (FAR) does not exceed 0.50.

UPLAND

152 ST

64 AVE

66 AVE

68 AVE

Church

HYLAND CREEK

ALR

ALR

ALR

LOWLAND

BEAR CREEK

10

5

WESTERLY LIMIT OF
200 YR. FLOOD PLAIN
2.6m ELEV

STUDY
AREA

north

TOPOGRAPHY PLAN

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE 2

APLIN MARTIN
CONSULTANTS LTD

Scale : 1:3000
Date : SEPT. 1998

It should be noted that the City of Surrey should monitor the level and type of development that occurs in the study area. If the average FAR is less than 0.50 and the number of vehicle trips is lower than predicted, it is possible to allow higher levels of development is subsequent phases.

The constraints are summarised as the following points:

1. The average Floor Area Ratio for the NCP area must not exceed 0.50.
2. A signal must be installed at 66A Avenue and 152 Street (prior to development of Phase Three).
3. The signals on 152 Street must be coordinated.
4. 152 Street must be constructed to ultimate municipal standard (raised median).
5. The speed limit on 152 Street needs to be reduced from 70 km/h to 60 km/h from 70 Avenue south prior to Phase Two.
6. The existing and future background traffic volumes on 152 Street constrain the ability of the study area to be developed at an average FAR greater than 0.50.

2.2.2 Proposed Site Development

The NCP study area is proposed to consist of a mixture of land uses including business park; commercial/retail; live/work; neighbourhood park; and, existing institutional (church) for a total of 93.4 acres including roads, buffers and bio-filtration ponds.

Land Use	Area (ha)	Percent of Total
Business Park	20.07	53.3
Live & Work	5.91	15.6
Park	1.94	5.0
Commercial	0.24	0.6
Existing Church	1.50	4.0
Buffers	2.19	5.8
Bio-filtration Pond	1.01	2.7
Roads	4.94	13.0
Totals	**37.80**	**100.0**

For the purposes of this study, only the Business Park and Live/Work land uses were used to generate trips. The City's Planning Department has indicated that the Commercial/Retail land use is intended to serve the East Newton NCP area only, intended to attract local trips or possibly pass-by trips only.

The Live/Work land use proposed for the site is the first of its kind for the City of Surrey and consequently little is known, at this point, about the development density, built form or trip generation characteristics of this type of development.

A number of land use scenario's were evaluated including all Business Park (no Live/Work) and various Floor Area Ratio's (FAR's) ranging from 0.50 to 1.0. The recommended scenarios, from a transportation perspective are either the all Business Park or the combined Business Park and Live/Work scenarios with an overall average Floor Area Ratio (FAR) not exceeding 0.50 for both scenarios.

2.2.3 Trip Generation

Trip generation for the site was evaluated using the ITE Trip Generation Handbook for three different land use types: Industrial Park, Office Park; and, Business Park. Based on the descriptions of each land use type in the handbook and based on discussions with Planning Department staff, it was deemed that the Business Park land use type would be most representative of the land uses anticipated in the site. In the table below, the trip generation used is illustrated in bold text.

Land Use	AM Peak			PM Peak		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Industrial Park (LUC 130)	882	132	1,014	230	865	1,095
Office Park (LUC 750)	2,042	252	2,294	291	1,647	1,938
Business Park (LUC 770)	1,740	307	2,047	368	1,304	1,672
Business Park / Live Work	**1,585**	**280**	**1,865**	**355**	**1,259**	**1,614**

As shown in the table above, the highest trip generation occurs during the AM peak. Since the proposed land uses are almost exclusively employment in nature, the trips generated by employees which is typically more sharply peaked in the AM than in the PM. That is, people tend to arrive at work at the same time but depart from work at a variety of times.

2.2.4 Trip Distribution

The trips were distributed to the network based on the Regional Travel Model as shown in the table below.

Sector of Surrey/GVRD	PM Inbound	PM Outbound
North on 152 Street		
N Surrey	11%	15%
NE Sector; Fraser North	6%	5%
NE Surrey	8%	8%
Richmond; S Delta	8%	4%
Vancouver, Burnaby, New West	17%	3%
W Van; N Van and CBD	2%	0%
South on 152 Street		
E Surrey	3%	6%
Fraser S; External	8%	11%
S Surrey; White Rock	8%	13%
SW Surrey	7%	11%
W Surrey	13%	13%
West on 68 Avenue		
NW Surrey	8%	9%
East Newton	1%	2%

2.2.5 Trip Assignment

Vehicle trips were assigned to the network for four scenarios: 1999 Background; 1999 Background + Site Generated; 2009 Background; 2009 Background + Site Generated. The background trips were forecast based on an average annual growth rate of 3%. In addition, for the 2009 traffic volumes for 148 Street, additional volume (over an above the 3% growth) was added to reflect the anticipated development of the East Newton South residential neighbourhood. It should also be noted that no site generated traffic was assigned to 66A Avenue due to the school zone between 149 Street and 151 Street. This results in a conservative analysis as it is likely that some traffic will use 66A Avenue even with the school zone.

The trip assignment is shown in Appendix "A".

2.2.6 Vehicle Traffic

Due to the relatively high existing and future background traffic volumes on 152 Street, access to the site, particularly during peak periods, will have to be accomplished through signalised intersections. Based on analyses of 66A Avenue as an unsignalized intersection, all of the left turn traffic out of the site (westbound to southbound) will have to use the signalised intersection at 68 Avenue. Effectively, the intersection at 66A Avenue functions as a right-in-right-out and left in only and eastbound or westbound through traffic must use 68 Avenue. Due to the volume of traffic generated by the site, both the 66A Avenue and 68 Avenue intersections will have to be signalised. Funnelling all of the traffic through the 68 Avenue intersection is not possible - the intersection will fail.

152 Street is one of only three major arterial roadways that traverses the entire length of Surrey and as such, it is not desirable to impede the flow of traffic on this corridor any more than is absolutely necessary. As a result, it is essential that the signals on 152 Street (64, 66A, 68 and 72 Avenues) must be coordinated

As shown on the following table, the intersections of 72 Avenue/152 Street and 64 Avenue/ 152 Street are critical within the road network. The 72 Avenue intersection is critical in the 1999 Scenario with full buildout in the AM peak and is critical during both peak periods in 2009 without the development of the NCP.

Intersection Level of Service

	1999 Bkgd.		1999 Full		2009 Bkgd.		2009 Full	
Intersection	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
72 Ave./152 St.		B	F	C	F	F	F	F
68 Ave./152 St.		A	C	B	A	B	F	D
66 Ave./152 St.		A	B	B	A	A	D	B/C
64 Ave./152 St.		B	D	C	D	C	F	F
148 St./64 Ave.		A		B		B		B
148 St./68 Ave.		B		B		B		C

Note: The intersection of 148 Street and 68 Avenue was analysed as four way stop control.

The 1999 AM background was not analyzed as there are currently no operational problems with 152 Street.

The analyses of the intersections of 152 Street at 66A Avenue and 68 Avenue assume that there are no network constraints up-stream of these intersections. As shown in the table, however, both the 64 Avenue and the 72 Avenue intersections are anticipated to operate a LoS F which will constrain the traffic demand at the 66A Avenue and 68 Avenue intersections. It is possible to improve the operating LoS of all of the intersections if additional Left Turn capacity could be provided (64 & 72 - E/W; 66A & 68 - N/S). Both 64 Avenue and 72 Avenue are constructed to ultimate therefore it is not feasible to anticipate significant increases in capacity at these intersections. It was discussed with the City of Surrey Engineering Department to provide two southbound left turn lanes at each of 66A Avenue and 68 Avenue but this concept was rejected because of the capacity constraints at 64 Avenue and 72 Avenue.

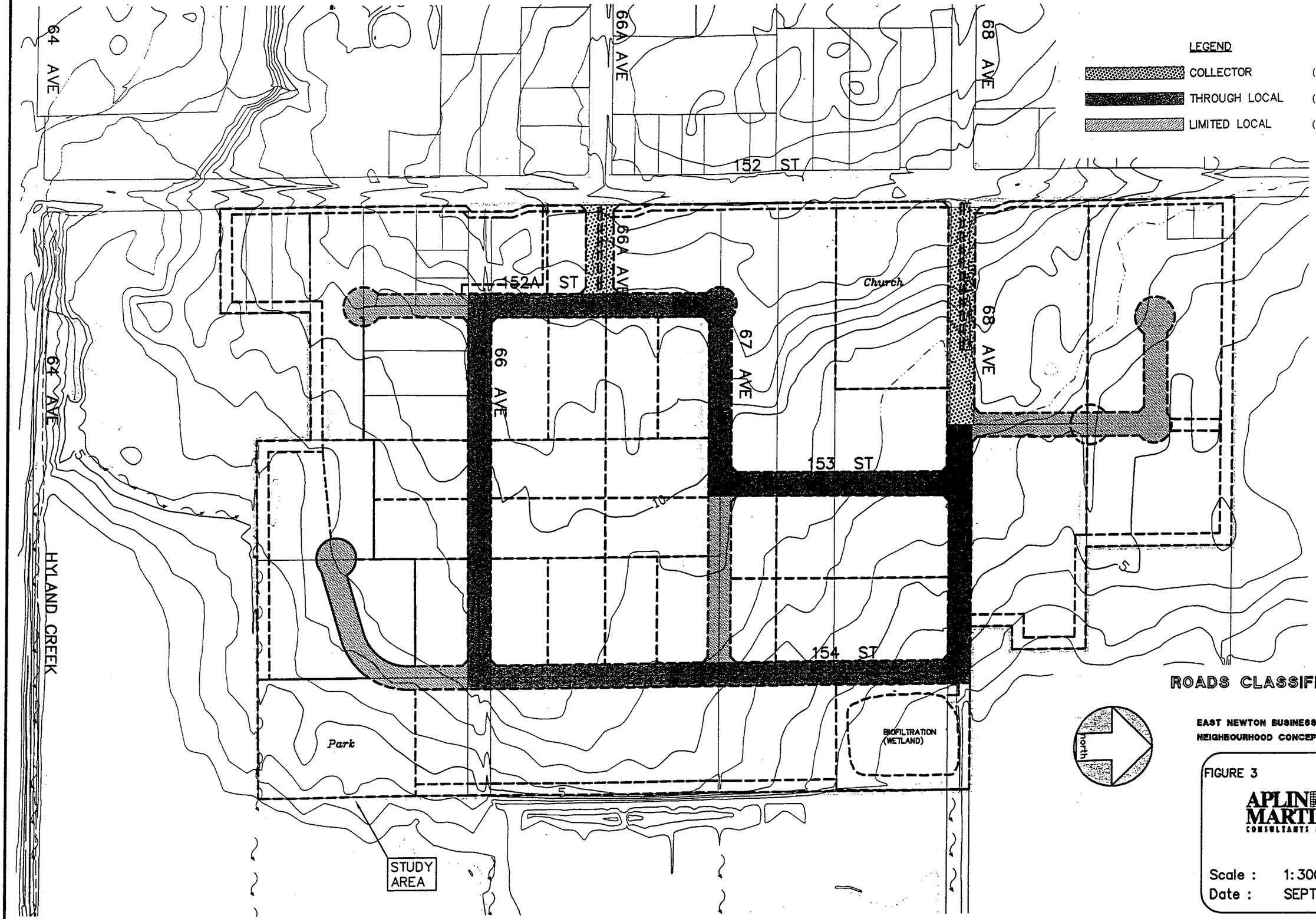
152 Street was recently constructed to its ultimate roadway width of 19.0 metres of asphalt. However, the sidewalk along the east side of 152 Street will need to be added along the entire frontage of 152 Street that is adjacent to the NCP study area. In addition a land dedication of approximately 1.5 metres is a requirement and would be dedicated during each phase of development along 152 Street. Presently the median on 152 Street consists of painted lines. A permanent raised median for controlling traffic at the two intersections would be required when this development proceeds.

2.2.7 Internal Road Network

The internal road network can be summarised as two distinct classes of roads: Industrial Collector and Industrial Local. The Industrial Collector (collector) road is the road that forms a crescent around the perimeter of the site, connecting 68 Avenue to 66A Avenue. The Industrial Local roads are all of the other internal roads. Figure 3 indicates the Road Classification plan. The limited local roads and the through local roads are all 11.0 metres on a 20.0 metre road dedication as shown in Figure 4. The 11.0 metre roads allow for two-way traffic with parking on one side of the roadway. The through collector roads are 12.2 metres plus a 2.0 metre median on 24.0 metres of dedication. The 12.2 metre width allows for left turn chanelization and allows for the construction of a median treatment (Figure 5).

Figure 6 depicts the roads options. "Fixed Roads" are needed as connections to key nodes and provision of perimeter vehicular flow through the site. "Flexible Roads" are roads that can be shortened or moved to assist in the accommodation of large developments or large lots within the study area. "Alternate Roads" are roads that can be shortened or even eliminated depending upon the size of the development. Lots that are approximately one or two acres in size would require the extension of the "Alternate Roads" as depicted on Figure 6.

The owner of the agricultural property to the south of the NCP study area is exploring options to develop the land. Notwithstanding that this land is located within the Agricultural Land Reserve,



ROADS CLASSIFICATION

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE 3

APLIN MARTIN CONSULTANTS LTD

Scale : 1:3000
Date : SEPT. 1998

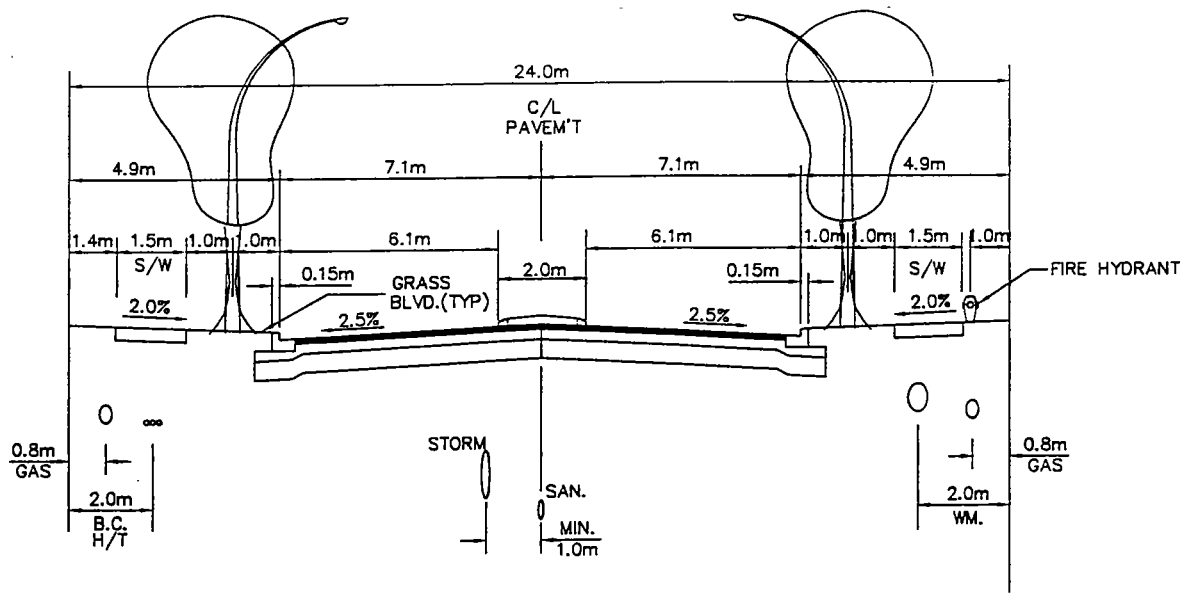


FIGURE 5

APLIN MARTIN CONSULTANTS LTD

NORTH

Scale : N.T.S.

Date : OCT. 1998

TYPICAL CROSS SECTION COLLECTOR ROAD

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

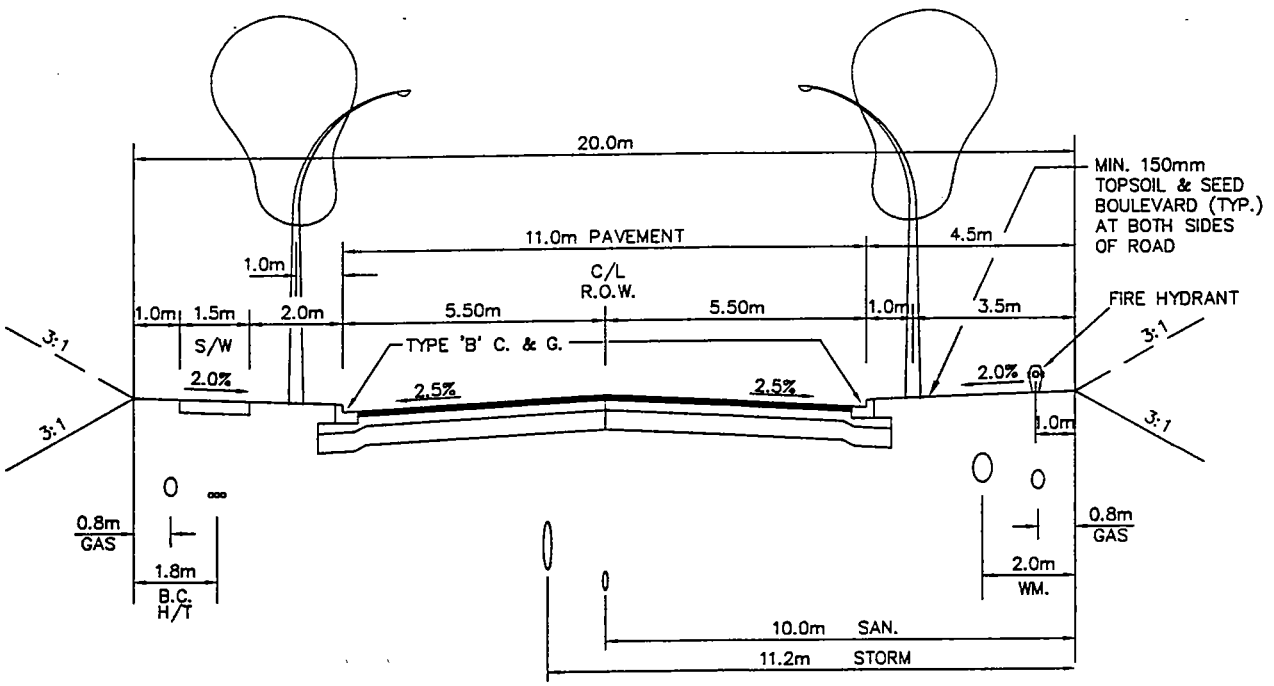


FIGURE 4

APLIN & MARTIN CONSULTANTS LTD

NORTH

Scale : N.T.S.

Date : OCT. 1998

TYPICAL CROSS SECTION THROUGH LOCAL & LIMITED LOCAL ROADS

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

LEGEND

FIXED ROADS

FLEXIBLE ROADS

ALTERNATE ROADS

64 AVE

66A AVE

68 AVE

152 ST

152A ST

66 AVE

67 AVE

153 ST

154 ST

Church

Park

BIOFILTRATION (WETLAND)

HYLAND CREEK

STUDY AREA

north

ROADS OPTIONS

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE 6

APLIN MARTIN CONSULTANTS LTD

Scale : 1:3000

Date : SEPT. 1998

if the owner is successful in developing the land an additional road link to 64 Avenue is strongly recommended. Depending on the type and density of development on this property, it is likely that there is not sufficient road capacity on 152 Street to accommodate this development. The owner's representative has indicated (personal correspondence, 99-01-20) that a road connection to 64 Avenue is being evaluated. This connection must be constructed as far to the east from 152 Street as possible, at an absolute minimum, 150 metres, to allow for the construction of back-to-back left turn bays (i.e., a new full movement intersection). If this "new" connection to 64 Avenue is constructed and connected to the Business Park road network, it is expected that the operation of the 66A Avenue and 68 Avenue intersections on 152 Street will improve.

2.2.8 Public Transit

At the present time the site is serviced by a single route, the "345" which links White Rock to Guildford Town Centre with 30 minute service during peak periods and 60 minute service during off-peak and evening periods. There is a major transit exchange in Newton at 138 Street and 72 Avenue but there is no service to this exchange at this time.

Given that the East Newton Residential NCP is currently developing and the East Newton (South) NCP is also anticipated to commence over the next few years it is possible that transit service could be improved to these areas and could include better service to the Business Park.

There are presently two bus stops along the east side of 152 Street servicing the NCP study area at 66 Avenue and 68 Avenue. Discussions with BC Transit indicate that the existing bus stop at 66 Avenue would need to be relocated to the new intersection at 66A Avenue. If the speed limit on 152 Street is to remain at 70 km/h bus pullouts will be required. Given that the west side of 152 Street will become residential and the east side a business park, it is recommended that the speed limit be decreased to 60 km/h south of 70 Avenue to reflect the urbanisation of this portion of 152 Street and to reflect the installation of signals at 68 Avenue and 66 Avenue.

2.2.9 Pedestrians

The type of development being proposed in the site is not conducive to high pedestrian trip generation either as an attractor or a producer. The greatest pedestrian trip generation will likely occur during the noon hour period when office employees walk either for exercise or to visit an on-site convenience store or restaurant.

To accommodate the pedestrians, sidewalks will be constructed on both sides of the collector roads and on one side of the local roads.

2.2.10 Cyclists

152 Street has been constructed with wide curb lanes (4.05 metres) in order to accommodate cyclists. The road network within the site does not require special construction standards or treatment in order to accommodate cyclists. Since the site is a destination without any through roads, the internal road network will be sufficient to accommodate cyclists. It is, however, necessary for developments internal to the site to provide bicycle storage, change rooms, and locker facilities for employees as well as bicycle storage for visitors. The City of Surrey's Bicycle Blueprint specifies the type and quantity of facility required, depending on the type and size of the land use.

2.3 WATERWORKS

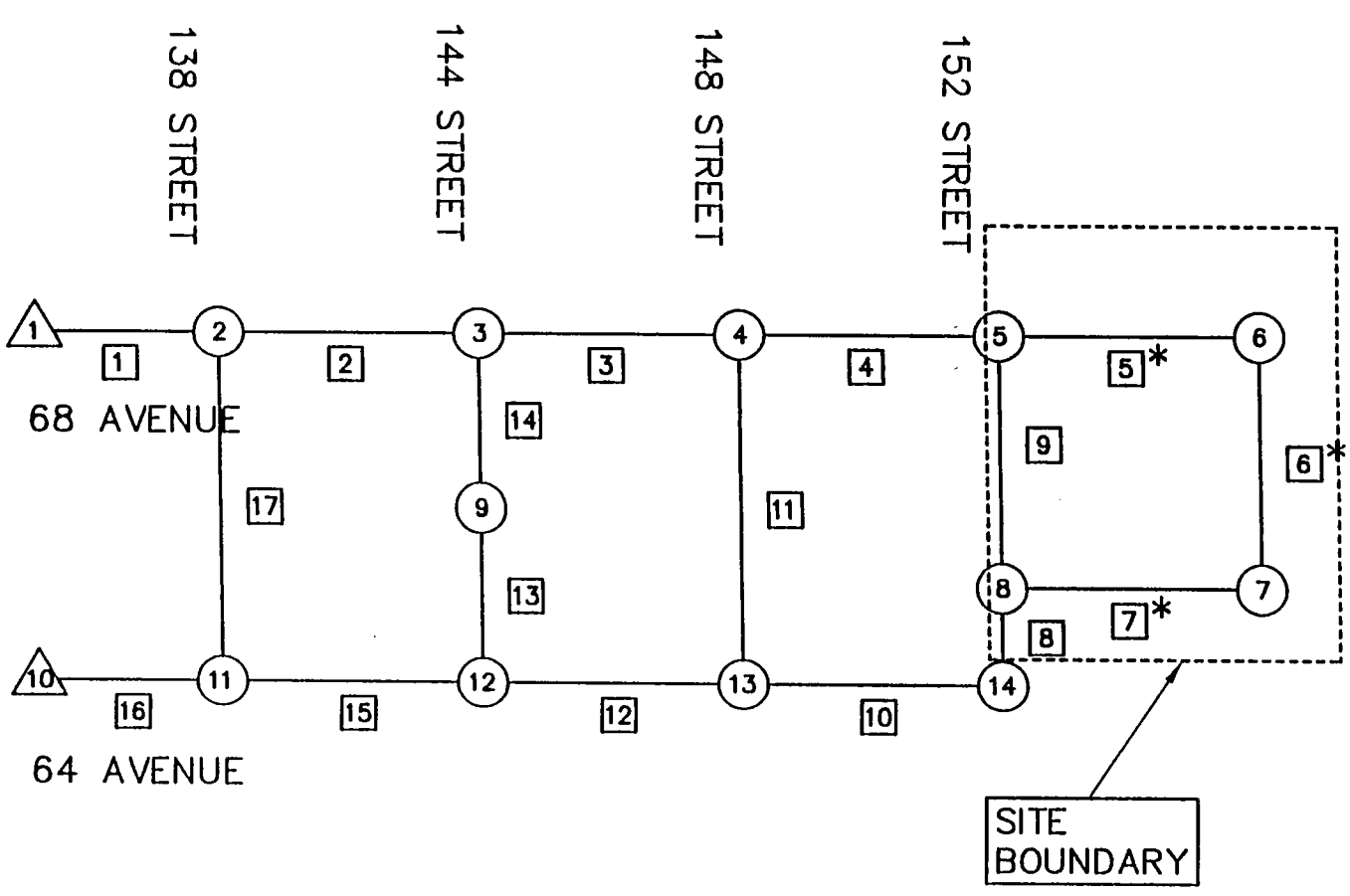
Water supply and pressure to the NCP study area is provided through the existing 300 mm diameter grid mains. There are two sources for the grid mains that lead to the site, namely 68 Avenue at 138 Street and 64 Avenue at 138 Street. The NCP study area is within the 90 metre HGL pressure zone. The existing water distribution system has an adequate sized system for providing sufficient quantities of water to the NCP area. No off-site water main upgrades are required and there are no constraints.

A computer analysis was prepared and used to determine any deficiencies and model the required sizes from the two sources to the site. Figure 7 depicts the water model schematic. The water model schematic was prepared using the City of Surrey's current design criteria. Based on the design criteria, the available head at source number one is 79.50 metres geodetic and at source number two is 79.24 metres geodetic. The result of the computer analysis is found in Appendix "B". Surrey's design criteria requires that the proposed water mains are capable of operating under the following conditions using a maximum water main velocity of 2.0 meters per second (2 m/s):

Demand Condition	Residual Head
Peak Hour Demand	28 metres
Maximum Day Demand Plus Fire Flow	 14 metres (at test hydrant)

No inadequacies were found and no offsite improvements are required.

Figure 8 shows the water distribution system within the NCP study area. Looped water main systems will be 300 mm diameter. Exceptions to this size will be 400 mm diameter in the proposed cul-de-sacs for the ultimate condition and 350 mm diameter in the phased construction areas for the



WATER MODEL SCHEMATIC

EAST NEWTON BUSINESS PARK NEIGHBOURHOOD CONCEPT PLAN

LEGEND:

- (13) NODE NUMBER
- [7] PIPE NUMBER
- 10 SOURCE NODE
- * PROPOSED PIPES

FIGURE 7

APLIN & MARTIN CONSULTANTS LTD

NORTH

Scale : N.T.S.

Date : SEPT. 1998

LEGEND

EXISTING WATERMAIN

PROPOSED WATERMAIN

64 AVE

EX. 300ø

EX. 200ø

66A AVE

EX. 300ø

68 AVE

EX. 300ø

152 ST EX. 300ø

152A ST

400ø

300ø

300ø

66 AVE

300ø

67 AVE

300ø

Church

68 AVE

300ø/(350ø)

400ø

400ø

153 ST

300ø

300ø/(350ø)

300ø/(350ø)

154 ST

300ø

300ø

400ø

10

5

5

HYLAND CREEK

Park

STUDY AREA

WATERMAIN

north

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE 8

APLIN MARTIN CONSULTANTS LTD

Scale : 1:3000

Date : SEPT. 1998

LEGEND

- EXISTING GVS & DD TRUNK SEWER
- EXISTING CITY SANITARY SEWER
- PROPOSED GRAVITY SANITARY
- PROPOSED SANITARY FORCEMAIN
- SANITARY (BY OTHERS)

64 AVE
66A AVE
68 AVE
152 ST
EX. GVS&DD SANITARY TUNK SEWER
EX. GVS&DD
152A ST
66 AVE
67 AVE
Church
EFFLUENT FROM EAST NEWTON (SOUTH) NCP TIEING INTO PROPOSED SANITARY SYSTEM
250mmø
INV.=6.5 DEPTH=4.0
FORCEMAIN
BY OTHERS
153 ST
INV.=2.1 DEPTH=5.4
INV.=2.2 DEPTH=4.8
300mmø
INV.=4.5 DEPTH=3.0
BOUNDARY DENOTING ELEVATION TO WHICH LOTS CAN BE SERVICED BY GRAVITY (TYP)
154 ST
375mmø SANITARY
INV.=3.9 DEPTH=5.1
INV.=3.4 DEPTH=5.6
INV.=2.85 DEPTH=4.4
INV.=1.0 DEPTH=1.5
Park
BOUNDARY DENOTING ELEVATION TO WHICH LOTS CAN BE SERVICED BY GRAVITY (TYP)
SANITARY LIFT STATION
STUDY AREA
HYLAND CREEK
north

SANITARY SEWERS

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE 9

APLIN MARTIN CONSULTANTS LTD

Scale : 1:3000
Date : SEPT. 1998

FLOW GENERATED FROM EAST NEWTON (SOUTH) DRAINING TO STUDY AREA

Residential: 108 homes x 3.0 capita/home	=	324 capita
Commercial: 0.7 ha x 50 capita/ha	=	35 capita
Total	=	359 capita

359 capita x 350 L/capita/day = 1.454 L/s

$$1+\frac{14}{4+\sqrt{0.359}}$$

Peaking Factor = 4.044

1.454 L/s x 4.044 = 5.88 L/s

Infiltration = 12.499 ha x 11,200 L/ha/day = 1.620 L/s

Design Q = 5.88 L/s + 1.62 L/s
= 7.50 L/s

Note:

The design Q (flow) has increased form 5.90 L/s to 7.50 L/s as a result of the infiltration component brought in by the latest changes to the design criteria.

FLOW GENERATED WITHIN THE EAST NEWTON BUSINESS PARK

The East Newton Business Park consists of three subcatchment areas as identified on Figure 1 earlier in the report. The following chart shows the resulting peaking factors and flows. The sewage flow rate is based on 350 litres per capita per day with the infiltration and inflow rate based on 11,200 litres per hectare per day from the January 31, 1999 Design Criteria.

Land Use/Zone	Area ha	Accum. Area ha	Equiv. Pop. Rate	Area Equiv. Pop.	Accumulated Equivalent Population	Average Sewage Flow (ADWF) L/sec.	Accum. Average Sewage Flow (ADWF) L/sec.	Peaking Factor	Accum. Sewage Flow (PDWF) L/sec.	Accum. Infil/Inflow L/sec.	Accum. Peak Sewage Flow (PWWF L/sec.
Church	1.99	1.99	50	100	100	0.40	0.40	4.24	1.71	0.26	1.97
Local Commercial	0.48	2.47	60	29	128	0.12	0.52	4.21	2.19	0.32	2.51
Business Park	34.05	36.52	90	3065	3193	12.41	12.93	3.42	44.22	4.73	48.96

Total flows from the East Newton Business Park is 48.96 litres per second. Therefore the East Newton (South) NCP contribution for the ultimate pump station is:

$$\frac{7.50}{(7.50+48.96)} x100 = 13.28\%$$

Note: The East Newton (South) NCP calculations assumed this ratio to be 11.32%.

The East Newton (South) tributary area would be discharging 13.28% of the total flow at the lift station.

2.4.3 Proposed Sanitary Sewer System

Figure 9 shows the proposed sanitary sewers, lift station and force main within the study area. It also indicates the ultimate sizes of the sanitary sewer required without having benefit of detailed topographic survey. The majority of the ultimate pipe diameters are 250 mm except for short sections of 300 mm and 375 mm required near the proposed pump station.

2.5 STORM SEWERS

2.5.1 Existing Conditions and Environmental Issues

There are no storm sewers of any significance within the NCP study area. There are local ditches and culverts on 66 Avenue and 68 Avenue which drain the majority of the study area easterly to the ditches located in the lowlands east of the site. These ditches and culverts would be replaced with a storm sewer system. As shown in Figure 2 previously, small portions of the study area also sheet flow north-east and south-east to the lowlands. There are four drainage ditches that flow across agriculture fields to the existing flood boxes located at the Serpentine River. A larger segment of the storm runoff flows into two well-defined ditches on 68 Avenue, which drain to the Serpentine River.

Envirowest Consultants Ltd. completed an assessment of the fish habitant in the existing ditches within the NCP area in January 1999. Their report reviews the classification of the existing watercourses within the study area and determined that the majority will require a reclassification as outlined in Envirowest's Table 1. The report summarises that the proposed biofiltration (wetland) pond will provide sufficient habitat features to offset the loss of the Class B habitats caused by the development of the Business Park. Envirowest's letter report is attached as Appendix C.

Their report describes that three of the 11 ditches do not exist, and the remaining eight require a lower reclassification as per Envirowest's Table 1. The only two ditches with a Class A (0) classification are the two 68 Avenue ditches located immediately east of the study area.

2.5.2 Servicing Constraints and Issues

The major constraint to the study area is the impact of increased flooding that would occur to the lowlands as a result of upland development in the study area. Since the flood duration is dependent on flood levels in the Bear Creek dyke, stormwater detention is not an effective means of reducing flood duration in the lowlands.

Small portions of the study area cannot be serviced without either filling the rear portion of lots or by pumping from the rear portion to the front of the lots. The affected areas are identified on Figure 10 by the denoted boundary. It is recommended that the buffer strip along the perimeter of the study area drain naturally via sheet flow to the agricultural fields. The proposed park in the south-east corner of the NCP study area is below the proposed storm sewer serviced area. It is recommended that the park drain naturally via sheet flow toward the agricultural fields. The proposed park is a significantly smaller catchment area than the existing catchment area that

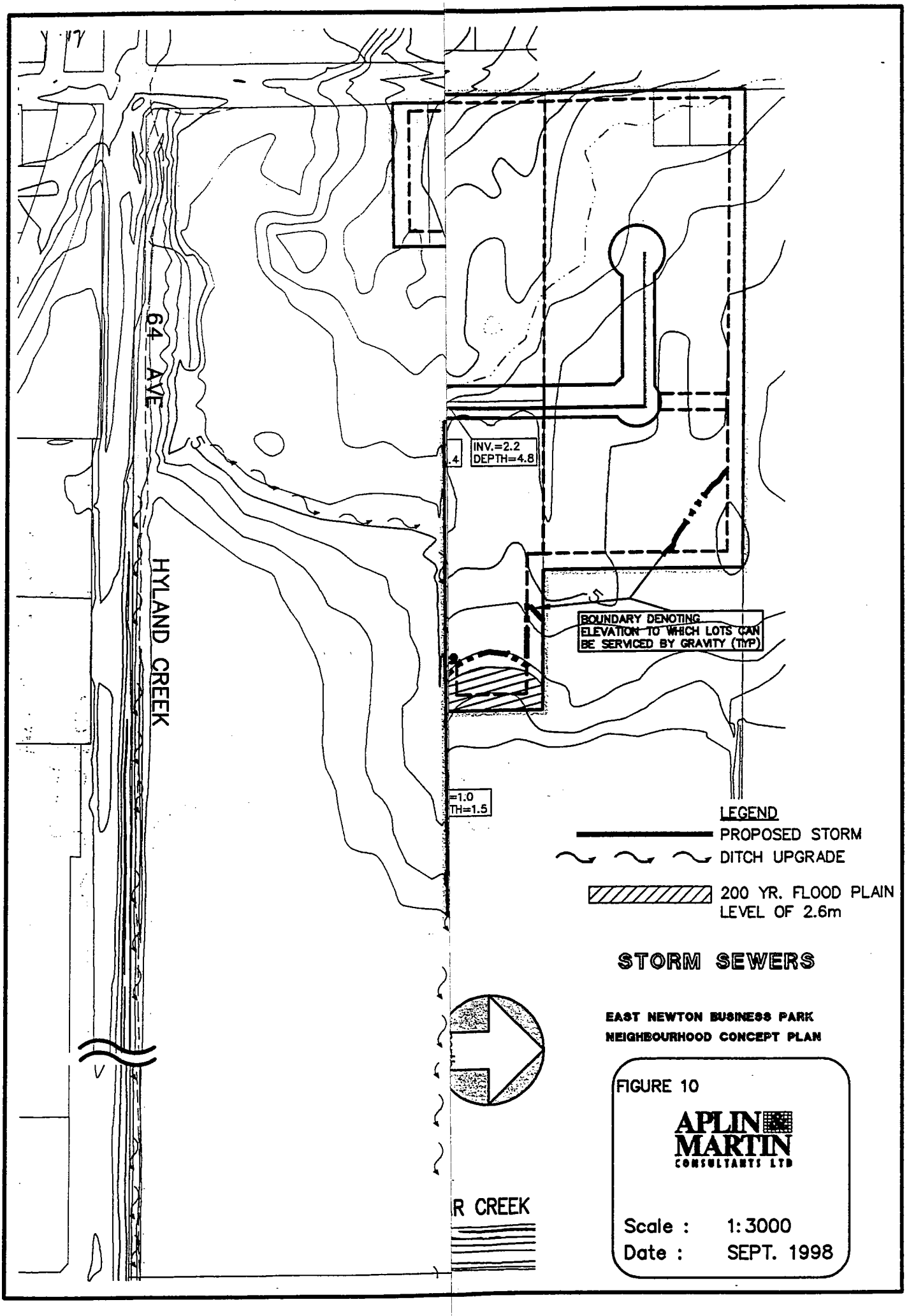
drains south-east and there will be a reduction in flow from the proposed park to the agricultural land.

Figure 10 also identifies three locations where the elevation of the 200 year flood level of 2.6 metres geodetic elevation is higher than the existing ground within the study area. The flood level of 2.6 meters has been identified on Figure 10 from information obtained on the Environment Canada and BC Ministry of Environment flood plain mapping plans dated September 30, 1994.

One of these areas is of significance to the business park, namely the cross hatching of a parcel of land located north of 68 Avenue. A second area is immediately south of 68 Avenue and is within the location of the proposed biofiltration pond and a small third area is the south eastern tip of the study area. The City of Surrey's bylaw for soil deposition within the flood plain does not allow for filling of these areas without allowing for a compensating excavating volume. That is, the volume of land being filled above the floodplain must be replaced with excavated volume below the floodplain. The net effect is to not increase the height of the flood levels caused by indiscriminate filling. The biofiltration pond will need to be constructed according to this concept.

Similar to a constraint as identified in the sanitary sewer Section 2.4.1, it is necessary to have the storm sewer traverse through a short distance of the site at a depth of approximately 5.6 metres. The storm sewers are similarly placed below the maximum design criteria depth of 3.5 metres in order to drain the perimeter lots by gravity as much as practicable. Similarly it will be necessary for the lot purchaser in the affected areas, to fill the rear portion of the lots starting at the buffer strip towards the centre of the lot. The lot can then drain by gravity to the serviced internal roads. As an option, the lot purchaser could allow the land to naturally fall to the east to the agricultural fields, but would need an additional biofiltration pond. Again, the proposed road profile for the two intersections would need to be lowered by up to one metre for the purpose of avoiding excessively deep storm sewers.

Another constraint is the timing of construction. The existing ditch on 68 Avenue east of the study is classified as A (0) on the Fisheries water course classification. Minor improvements (clearing and reshaping of ditch where it has eroded) to the existing ditch on 68 Avenue will be required and construction of the biofiltration pond needs to be built within the allowable Fisheries window of July 15 to September 15.



STORM SEWERS

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE 10

APLIN MARTIN CONSULTANTS LTD

Scale : 1:3000
Date : SEPT. 1998

2.5.3 Offsite Drainage to Bear Creek Lowlands

As described in Section 2.5.2, the additional runoff generated by the development of the study areas has the potential to increase flooding to downstream lands in the agricultural lowlands. Several options for consideration are:

i) Provide a pump station and improved conveyance system to limit flooding to ARDSA standard; or

ii) Provide a detention pond and a slow release rate for long duration storage.

Item ii) is an impractical option as it would need a large land area and becomes too costly to develop. Item i) is compatible to the City's current strategy for lowland flood control.

The City of Surrey has engaged CH2M Gore & Storrie (G & S) to prepare a report known as the Functional Plan for East Newton Pump Station as part of the lowland flood control program and for the East Newton South NCP.

It makes sense to combine a solution for all three issues, namely:

- lowland drainage improvement;
- impact from East Newton South NCP; and
- impact from East Newton business Park NCP.

The G & S report outlined the flow capacity required and related cost estimates. The financing and implementation options are discussed further in Section 3.0.

The flow requirements in the above report are summarised as follows:

Lowland Drainage Improvement	0.75 m^3/sec.
East Newton South NCP (Residential)	0.25 m^3/sec.
East Newton Business Park NCP	0.46 m^3/sec.
Total Discharge Pump Rate	1.46 m^3/sec.*

The above flows are not cumulative. The combined pump rate of 1.46 m^3/sec. is based upon two relevant sets of criteria, design storms being concurrent and one pump station being constructed.

The existing ditch on 68 Avenue east of the study area requires cleaning and reshaping as recommended in the G & S report.

The G & S report focuses on the pump station needs for the study area as well as minor upgrading to the existing ditch along 68 Avenue between the study area and the proposed pump station adjacent to the Serpentine River and at 68 Avenue. Both the residential NCP and the Business Park NCP cannot proceed to development without construction of the pump station. The pump station and ditch upgrading would need to be constructed ahead of the first phase of the Business Park NCP. The G & S report as identified above, has the final recommendations and cost estimates which will impact the East Newton Business Park NCP. The East Newton Pump Station is being prepared as a Phase Two project in the Serpentine flood control project and would likely be constructed in 2004 in accordance with the Engineering Departments schedule for lowlands improvements.

2.5.4 Proposed Storm Sewer System

The proposed drainage system will collect runoff for the majority of the study area and direct it to the existing ditch on 68 Avenue east of the study area. Before discharging storm water flow into the existing ditch on 68 Avenue in the lowland area, the storm water will flow through the biofiltration pond. The biofiltration pond was sized based on Ministry of Environment guidelines of 2.5 to 3.0% of the developed land area. The purpose of the biofiltration pond is to capture a significant proportion of suspended solids during more frequent storm events. A single biofiltration pond was selected versus individual water treatment applied throughout the study area, as it is more cost effective; and a majority of the required land area for the selected biofiltration pond, is below the 200 year flood plain. As this land cannot be filled or developed as a serviced lot, this land is being cost effectively utilized for this purpose. The biofiltration pond would be designed in accordance with Ministry of Environment regulations. Areas north of 68 Avenue and south of 66 Avenue that presently drain away from 68 Avenue will be redirected to the 68 Avenue ditch. Small areas at elevations below the gravity service boundary (as noted on Figure 10) will continue to drain away from 68 Avenue. There are no upstream areas outside of the study area that drain through the study area in either the existing or future conditions.

The proposed business park will create an increase in impervious areas. This, combined with the enlarged catchment area, will increase flows to the 68 Avenue ditch.

2.5.5 Storm Water Modelling

The results of the storm water modelling determined in this section was coordinated with the December 1998 report prepared by G & S. The Gore & Storrie report confirmed that there is a need for upgrading the capacity of the drainage pump station to meet the requirements of both the proposed business park and the residential NCP. The details for the storm water modelling for the business park is described in the following paragraphs.

Storm water modelling has been completed, using the computer program XP-SWMM, to assess the downstream impact of development in the NCP study area. Hydrology was modelled using the SWMM RUNOFF block and hydraulics were modelled using the EXTRAN block. The Aplin & Martin model is limited to the study area. G & S worked with Aplin & Martin's results and incorporated it into their model and sized the pump station accordingly. Details of the storm water analysis can be found in Appendix "D".

As per the City of Surrey design criteria, peak flows and hydrographs were calculated for the 5 year and 100 year return period events. The 2, 6, 12, and 24 hour storm durations were modelled for each of the return periods, in both the pre- and post-development conditions.

Model calculations predict that the peak flows in the 68 Avenue ditch will increase in the order of four to six times in the post-development condition. However, the existing ditch has adequate capacity for post-development peak flows generated by the 100 year storm. As identified in the G & S December 1998 report, increased runoff from the study area will impact the proposed lowlands area downstream. Impact to the lowlands from upland development in the study has been quantified in the Functional Plan for the East Newton Pump Station.

2.6 HYDRO, TELEPHONE, CABLE AND GAS SERVICES

The business park would be serviced via underground services which are namely: electrical, telephone, cable TV and gas services. As per the City of Surrey's design criteria, no overhead servicing would be permitted.

BC Gas and Rogers Cable TV have adequate capacity in their utilities located along 152 Street frontage. BC Hydro has capacity to service the first phase of the project. However, dependent upon the timing for the second and subsequent phases and BC Hydro's timing for offsite improvements to the existing electrical distribution system, there may be a requirement of an offsite System Contribution Improvement of up to $50,000.00. This cost is over and above the normal material costs and charges that are applicable to underground servicing of the internal NCP study area. If the entire study area proceeded all at once, there would be Offsite System Contribution Improvement of $50,000. If the subsequent phasing to the NCP study area proceeds within BC Hydro's planned phasing of offsite improvements, the $50,000.00 cost can be reduced to zero.

BC Telephone does not have capacity in their plant for the NCP study area. BC Telephone requires a three (3) metre by five (5) metre right-of-way for the location of a small "WIC" building to house their equipment. The equipment will include optic fibre-fed electronic switching as opposed to copper wires. The right-of-way would need to be located in Phase One, adjacent to the road allowance and not on the collector portion of 68 Avenue. A suggested

location for the three by five meter BC Telephone Right-of-way is shown on Figure 10. The exact location for the WIC building would be determined during detailed design and in consultation with BC Telephone.

Letters as received from the utility companies are attached in Appendix "E".

3.0 FINANCIAL ASPECTS OF THE PLAN

3.1 INFRASTRUCTURE FUNDING

The City of Surrey has taken the following approach to infrastructure funding in the NCP areas.

1. The long term DCC revenues and expenditures for major collector roads, water, sanitary and drainage works should balance or show a positive cash flow at buildout. This applies to DCC revenues and expenditures within the NCP area. If the NCP's total DCCs are less than the expenditures, the NCP may still go ahead but the costs above the revenues generated through the specific NCP DCCs will only be provided by the City when the works become a City priority or can be frontended and recovered as per Item 5 below.
2. The short term annual DCC revenues and expenditures must also balance or the development community within the NCP must address the short term cash flow problem.
3. The City will not fund interim works.
4. The City-wide based DCC collection and expenditure program is the basis of all DCC capital works.
5. In Bill 46, Local Government Statutes Amendment Act (No. 2), 1997, the Provincial Government added Section 937.1 regarding development agreements with developers. This section enables the City flexibility to repay developers who build infrastructure under an agreement with the City. Surrey Council has supported this approach. Details of such an agreement are discussed later in this report.

All of the major works identified to service the East Newton Business Park NCP are within the current 10 Year Engineering Servicing Plan with the exception of the traffic light at 66 A Avenue/152 Street intersection.

This section of the report describes the major works required, DCC Revenues and projected expenditures, financial options and cash flow analysis.

3.2 DCC ELEMENTS

The 1997 City of Surrey's 10 year capital plan includes engineering works which are required for both the existing and future needs of the community. Typically the existing needs are funded from general revenue monies or grants and infrastructure required for growth is principally funded by developers through Development Cost Charges (DCCs).

The City will only fund works which are included in the 10 year plan and DCC program. DCC works can either be built by the City or developers. Given the size of the DCC program and the time requirements for infrastructure to be built, developers typically build many DCC works and receive DCC rebates/credit for the works they build.

The City has specific criteria for a work to be included as a DCC element in their program. Table 3.2.1 lists the proposed eligible DCC items by service. The table also notes whether the item is an addition to the current 10 Year Servicing Plan or a substitution. The traffic signal at the 152 Street/66A Avenue intersection is presently not in the 10 Year Servicing Plan and will need to be added to the 10 Year Servicing Plan.

(Note that the proposed timing shown is based on projected development needs. The actual timing of construction by Surrey may differ. Only those DCC elements in the current 10 year plan [DCC elements] may receive DCC rebates/credits as per the current City policy. The proposed works in the NCP will be eligible if they are added to the 10 year plan [DCC elements].)

Table 3.2.1
East Newton Business Parks
NCP Infrastructure Financing and Funding

Item	Total Capital Costs ($)	10 Year Servicing Plan Date for Implementation
Sanitary Sewer		
• Pump Station & Force Main	862,000	2002
Storm Sewer		
• Drainage Pump Station	1,493,000	2004
• 68 Avenue Ditch Improvements	30,000	2004
Arterial Roads		
• 152 Street/66A Ave. Traffic Signal	90,000	Not in 10 Year Plan

3.3 FINANCING BASED ON FULL BUILDOUT

The East Newton Business Park has only one Development Cost Charge (DCC) rate applicable for all industrial zones including the live/work area with one exception. The total area of industrial land after road dedication is 70.19 acres. The only other DCC rate is for a small commercial area of 0.77 acres. These areas include the related buffers and exclude the biofiltration pond and park as identified on Figure 1. The calculation of DCC revenue is based on the following areas and units:

Proposed Zoning	Area	Units	Cost
Industrial	70.19 acres	70.19 acres	$42,470/acre **
Commercial *	0.77 acres	6,708 sq. ft.	$5,310/1,000 sq. ft. **

* Assume that 2/3 of 30% of the total commercial retail area will be absorbed by buildings. 30% = Allowable Buildable Area

** These costs include Arterial Road DCCs. The Arterial Road DCCs are not included in the following tables.

The DCC revenue is based on the most recent DCC schedule under By-law 13476 which was adopted by Council on July 28, 1998.

Table 3.3.1 below provides the projected total revenue generated from the collection of DCCs based upon full buildout.

Table 3.3.1
Projected DCC Revenues Based on the Various Land Uses

Zone	Area (Acres)	Water ($)	Sewers ($)	Major Collector Roads ($)	Stormwater Management ($)	Total ($)
Industrial	70.19	201,445	188,109	230,223	1,415,030	2,034,807
Commercial*	0.77	2,147	2,012	4,159	10,331	18,649
Total Revenue		**$203,592**	**$190,122**	**$234,382**	**$1,425,361**	**$2,053,456**

* Assume that 2/3 of 30% of the total Commercial Retail area will be absorbed by Buildings.

Roads

Since 152 Street is an arterial road, all of the upgrading would be paid for from the Arterial Road DCC funds that are collected. The arterial road improvements include raised medians at both the 66A Avenue and 68 Avenue intersections, (for south bound traffic turning east) 68 Avenue and 66A Avenue traffic signals, relocated bus bay from 66 Avenue to 66 A Avenue and sidewalks for the full frontage along 152 Street. Details for these DCCs capital works are found in Appendix "F". The DCC rate for Arterial Roads is $13,480.00 per acre. The projected DCC revenue for arterial roads is $898,159.00 versus capital costs of $290,000. It is assumed that the need for arterial roads is principally driven by the larger community needs and therefore these costs have not been included in the following tables.

Sanitary

The capital costs for the sanitary works includes a lift station and appurtenances, emergency pump generator, force main and tie-in to the existing GVS & DD Trunk Sewer.

Storm Sewer

The capital costs for the storm works includes minor upgrading and clearing of the existing 68 Avenue ditch and the drainage pump station. These costs are presented in Table 3.3.2.

Storm Sewer Levy

The biofiltration pond and required land acquisition is not a DCC item and is not in the 10 Year Servicing Plan. The estimated cost for the biofiltration pond is $923,400 and a special levy assessed against the study area is $13,000/acre. Details for the related costs and calculations are found in Appendix F.

The City of Surrey provided the unit rates used to develop the capital works. A copy of the unit rates are found in Appendix "G". The above costs include a 50% factor to cover GST, design, administration and project contingency.

As identified earlier in Section 2.6, a possible offsite system contribution improvement cost payable of $50,000 to BC Hydro may be required if the NCP study area proceeded all at once or if Phases Two, Three and Four are brought on-stream sooner than BC Hydro would plan the growth of their physical plant.

Table 3.3.2 below shows details of total DCC revenue versus the expenditure of capital works.

Table 3.3.2
Projected DCC Revenues and Expenditures at Buildout

	Projected Total Expenditures ($)	Projected DCC Revenues ($)	Projected Business Park Expenditures ($)	Surplus Balance (Deficit Balance) ($)
Water ($2,870/Acre)	0	203,592	0	203,592
Sanitary Sewer ($2,680/Acre)	862,000	190,122	747,500 *	(557,378)
Major Collector Road ($3,280/Acre)	0	234,382	0	234,382
Storm Sewer ($20,160/Acre)	1,523,000	1,425,360	647,590 **	777,770

* From Section 2.4.2, the East Newton South contributing area is 13.28% or approximately $114,500.

** The costs for the pump station is $1,493,000, which is based on the total flow requirement of 1.46 m^3/sec. as described earlier in Section 2.5.3. These figures are from CH2M Gore & Storrie's December 1998 report. With the assumption that the Residential NCP and the Business Park NCP proceeds first, a prorated sharing of costs was developed as follows:

The City of Surrey (@.75 m^3/sec.)	$493,460
East Newton (South) NCP (@.25m^3/sec.)	351,950
East Newton Business Park (@.46 m^3/sec.)	647,590
Total Pump Station Costs	**$1,493,000**
68 Avenue Ditch Upgrading for Business Park	30,000
Total Cost	**$1,523,000**

The above DCC rates are for industrial zones. The commercial retail DCC rates are included in the DCC revenue but are based on a total rate of $5,310/1,000 sq. ft. of building area.

3.4 PHASING OF DEVELOPMENT

The collection of DCCs for the business park and commercial lot will not occur until building permits are being applied for. Financial options and conclusions are found in Sections 3.5 and 3.6. It may not be feasible for the developer to consider financing the entire NCP study area at

once, therefore the following phases are briefly discussed for financial consideration and budgeting purposes. The negative side of phasing is that it will take longer to recover the required DCCs.

3.4.1 Phase One

Several factors dictate the phasing of development: the readiness of property owners to proceed; the physical ability to proceed given the configuration of sewer, water and roadways in the area; and the amount of property required to support the funding of needed infrastructure works at each stage of development.

For the East Newton Business Park, a logical sequence for the phasing is from north to south as shown in Figure 11. Phase One would encompass the land area on both sides of 68 Avenue. Several factors for this area being Phase One are as follows:

a) The east end of 68 avenue is the lowest point on the site and leads to the natural selection of location for the sewage lift station, the storm sewer outfall and biofiltration pond.

b) The storm sewer discharges into an existing ditch that would drain to the proposed drainage pump station on 68 Avenue east of the NCP study area.

c) Road access is immediately available and 68 Avenue will be signalised in Phase One, which in turn produces a highly desirable access/egress point for the remaining phases.

d) A highly desirable all-directional access/egress point encourages development of the serviced land to occur quickly and assists in accelerating the following phases.

e) Can achieve the maximum allowable road length of 400 metres before a secondary road access is required.

The most northern segment of land (north of 68 Avenue) can be phased into any of the four phases. This northern land segment is serviced from Phase One and has no restrictions as to which phase it is placed in. Based on the East Newton (South) NCP proponents wanting to proceed with their residential development (west of 152 Street) in the near future and their desire to minimise their servicing costs by tying into the East Newton Business Park sanitary lift station; it is recommended that the northerly land segment proceed with Phase One.

3.4.2 Other Phases

Phase Two, as shown on Figure 11, is the next logical phase. this phase provides a second access point to 152 Street, and provides a cost effective road loop and water main loop. Phase Three completes the remaining roadworks and water main loops on a cost effective basis (no temporary

64 AVE

66A AVE

152 ST

68 AVE

64 AVE

152A ST

66A AVE

66 AVE

PHASE II

67 AVE

Church

68 AVE

PHASE I, II, III, OR IV

PHASE III

152 ST

PHASE I

154 ST

INFILTRATION (WETLAND)

HYLAND CREEK

STUDY AREA

north

PROPOSED PHASING

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE 11

APLIN MARTIN CONSULTANTS LTD

Scale : 1:3000
Date : SEPT. 1998

152 STREET

66 AVENUE

64 AVENUE

68 AVENUE

CATCHMENT BOUNDARY

1
17.43

STUDY AREA

1

2

3

10

5

LEGEND

1 / 12.0	CATCHMENT NUMBER AREA IN HECTARES
	PROPOSED STORM
	DITCH UPGRADE
10	MODELLING NODE NUMBER
11	MODELLING LINK NUMBER
	CATCHMENT BOUNDARY
	SUB-CATCHMENT BOUNDARY
	DRAINAGE FLOW

PRE-DEVELOPMENT CATCHMENT MAP

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE A

APLIN MARTIN CONSULTANTS LTD

NORTH

Scale : 1:3000

Date : OCT. 1998

152 ST

152A ST

66A AVE

64 AVE

66 AVE

67 AVE

68 AVE

153 ST

154 ST

HYLAND CREEK

Church

Park

INV.=6.5
DEPTH=4.0

INV.=4.5
DEPTH=3.0

INV.=3.9
DEPTH=5.1

INV.=3.4
DEPTH=5.6

INV.=2.85
DEPTH=4.4

INV.=2.1
DEPTH=3.4

INV.=2.2
DEPTH=4.8

INV.=1.0
DEPTH=1.5

1
14.80

2
3.92

6
16.36

10
1.05

INFILTRATION
(WETLAND)

BOUNDARY DENOTING
ELEVATION TO WHICH LOTS CAN
BE SERVICED BY GRAVITY (TYP)

BOUNDARY DENOTING
ELEVATION TO WHICH LOTS CAN
BE SERVICED BY GRAVITY (TYP)

STUDY
AREA

DRAINAGE
PUMP STATION

156 ST.

LEGEND

- 1 / 12.0 — CATCHMENT NUMBER / AREA IN HECTARES
- PROPOSED STORM
- DITCH UPGRADE
- (10) — MODELLING NODE NUMBER
- 11 — MODELLING LINK NUMBER
- CATCHMENT BOUNDARY
- SUB-CATCHMENT BOUNDARY
- DRAINAGE FLOW

POST DEVELOPMENT CATCHMENT MAP

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE B

APLIN MARTIN CONSULTANTS LTD

NORTH

Scale : 1:3000

Date : OCT. 1998

The SWMM RUNOFF module uses a non-linear reservoir routing method. A rainfall hyetograph is accepted and a step by step accounting of infiltration losses, overland flow and surface detention is made to generate an outflow hydrograph for a given subcatchment. The Green-Ampt method, operating within the SWMM RUNOFF module, was used to calculate infiltration losses.

The calculation is dependent on a number of estimated parameters that reflect the physical characteristics of the subcatchment. The infiltration parameters shown in Table B were used for all subcatchments in both the pre- and post-development condition. These values are empirically estimated, as there is no actual soil data available. Any error introduced because of this is considered manageable, as the calculation is more dependent on the subcatchment parameters. The subcatchment parameters are also estimated, but with a much higher degree of accuracy as they are derived from easily quantified surface geometry. Subcatchment parameters are summarised for the pre- and post-development conditions in Tables C and D respectively.

Table B
Study Area Infiltration Parameters

	Impervious	Pervious
Depression Storage (mm)	2.5	5
Manning's "n"	0.05	0.4
Zero Detention (%)	0	-
Average Capillary Suction (mm)		5
Initial Moisture Deficit		0.05
Saturated Hydraulic Conductivity (mm/hr)		1.5

Table C. Pre-Development Catchment Parameters

Pre-Development Node Data				
Node	**Area (ha)**	**Impervious (%)**	**Slope (%)**	**Width (m)**
1	17.43	25	2.00	860

Table D. Post-Development Catchment Parameters

Post-Development Node Data				
Node	**Area (ha)**	**Impervious (%)**	**Slope (%)**	**Width (m)**
1	14.8	90	1.60	1770
2	3.92	90	2.00	740
6	16.36	90	2.60	2230
8	1.05	20	2.00	200

1.5 TIME OF CONCENTRATION

The time of concentration (t_c) can be defined as the time taken for the most remote portion of the catchment to contribute to flow at the outlet of that catchment. The SWMM RUNOFF module uses a kinematic wave formulation to calculate the t_c. Overland flow is visualised as running downslope off an idealized rectangular catchment with the width (W) being the width of the overland flow. The width is generally estimated as double the length of the main drainage channel for a symmetric subcatchment.

1.6 HYDROLOGIC MODELING

Hydraulic modeling was completed using the EXTRAN module of the computer program XP-SWMM.

EXTRAN is a hydraulic flow routing model for both open channel and closed conduits in dendritic and looped networks. EXTRAN receives hydrograph input at specific nodal locations by interface file from an upstream block (e.g., the Runoff Block) and/or by direct user input. The model performs dynamic routing of storm water and sanitary flows throughout the major storm drainage system to the outfall points of the receiving water system.

Conduit data for the pre- and post-development conditions are shown in Tables E and F respectively.

Table E. Pre-Development Conduit/Link Data					
Link	**Length (m)**	**Dia/Depth (m)**	**Conduit Type**	**Slope (%)**	**Capacity (cms)**
3	280	1.40	Trapezoidal	0.386	15.64

Table F. Post-Development Conduit/Link Data					
Link	**Length (m)**	**Dia./Depth (m)**	**Conduit Type**	**Slope (%)**	**Capacity (cms)**
3	210	0.75	Circular	0.595	1.015
5	220	0.75	Circular	0.909	1.254
7	160	0.60	Circular	1.469	0.879
9	40	0.90	Circular	3.125	3.797
11	60	0.90	Circular	0.5	1.513
13	280	1.40	Trapezoidal	0.454	16.963

1.7 MODELING OUTPUT

Calculated peak flows for the 5 year and 100 year return periods and the various storm durations are shown in Tables G and H. Hydrographs generated for the 100 year storm are also shown in Figures E, F, G, and H.

Table G. Pre-Development Peak Flows

Link	**5 Year Return Period**				**100 Year Return Period**			
	2 Hr.	**6 Hr.**	**12 Hr.**	**24 Hr.**	**2 Hr.**	**6 Hr.**	**12 Hr.**	**24 Hr.**
3	0.182	0.210	0.275	0.273	0.362	0.418	0.557	0.558

Table H. Post-Development Peak Flows

Link	**5 Year Return Period**				**100 Year Return Period**			
	2 Hr.	**6 Hr.**	**12 Hr.**	**24 Hr.**	**2 Hr.**	**6 Hr.**	**12 Hr.**	**24 Hr.**
3	0.509	0.367	0.715	0.595	0.820	0.550	1.092	0.895
5	0.649	0.464	0.914	0.756	1.038	0.696	1.353	1.138
7	0.601	0.411	0.854	0.677	0.938	0.614	1.267	1.019
9	1.238	0.874	1.758	1.434	1.967	1.310	2.620	2.150
11	1.255	0.893	1.788	1.460	2.002	1.342	2.675	2.196
13	1.211	0.877	1.675	1.416	1.928	1.324	2.536	2.158

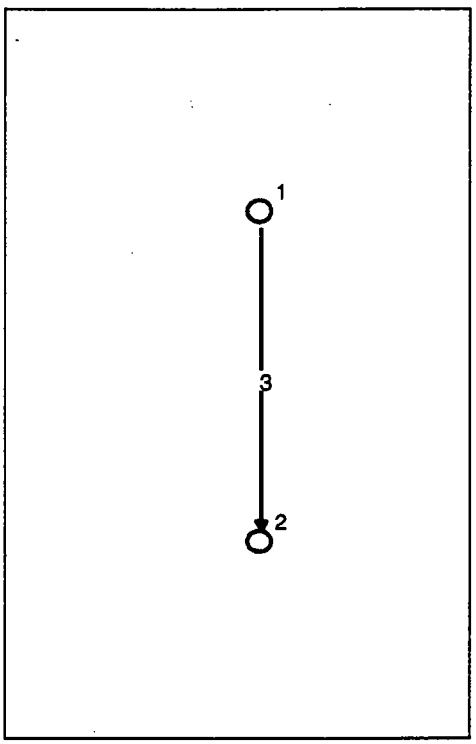


Figure C. Pre-Development Model Schematic

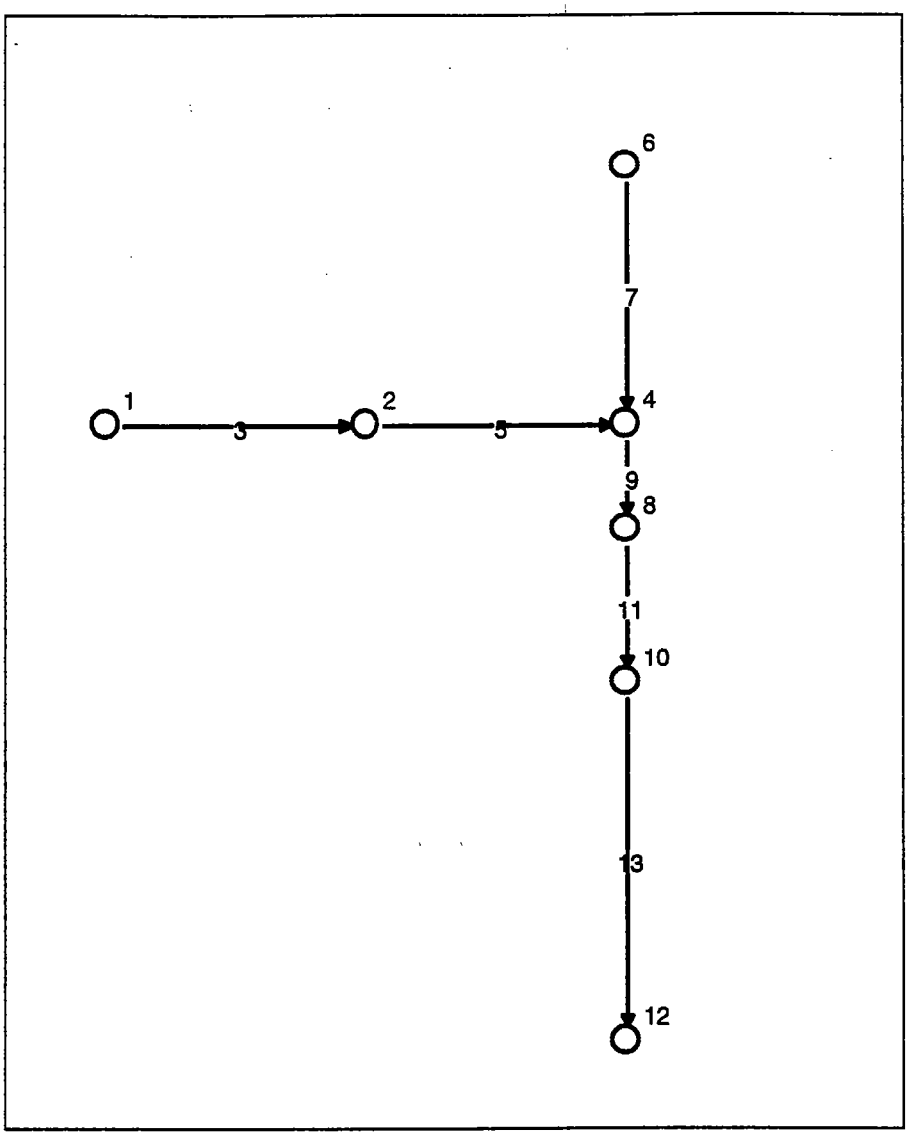


Figure D. Post-Development Model Schematic

Figure E.
PRE AND POST DEVELOPMENT HYDROGRAPH
100 YEAR 2 HOUR STORM EVENT

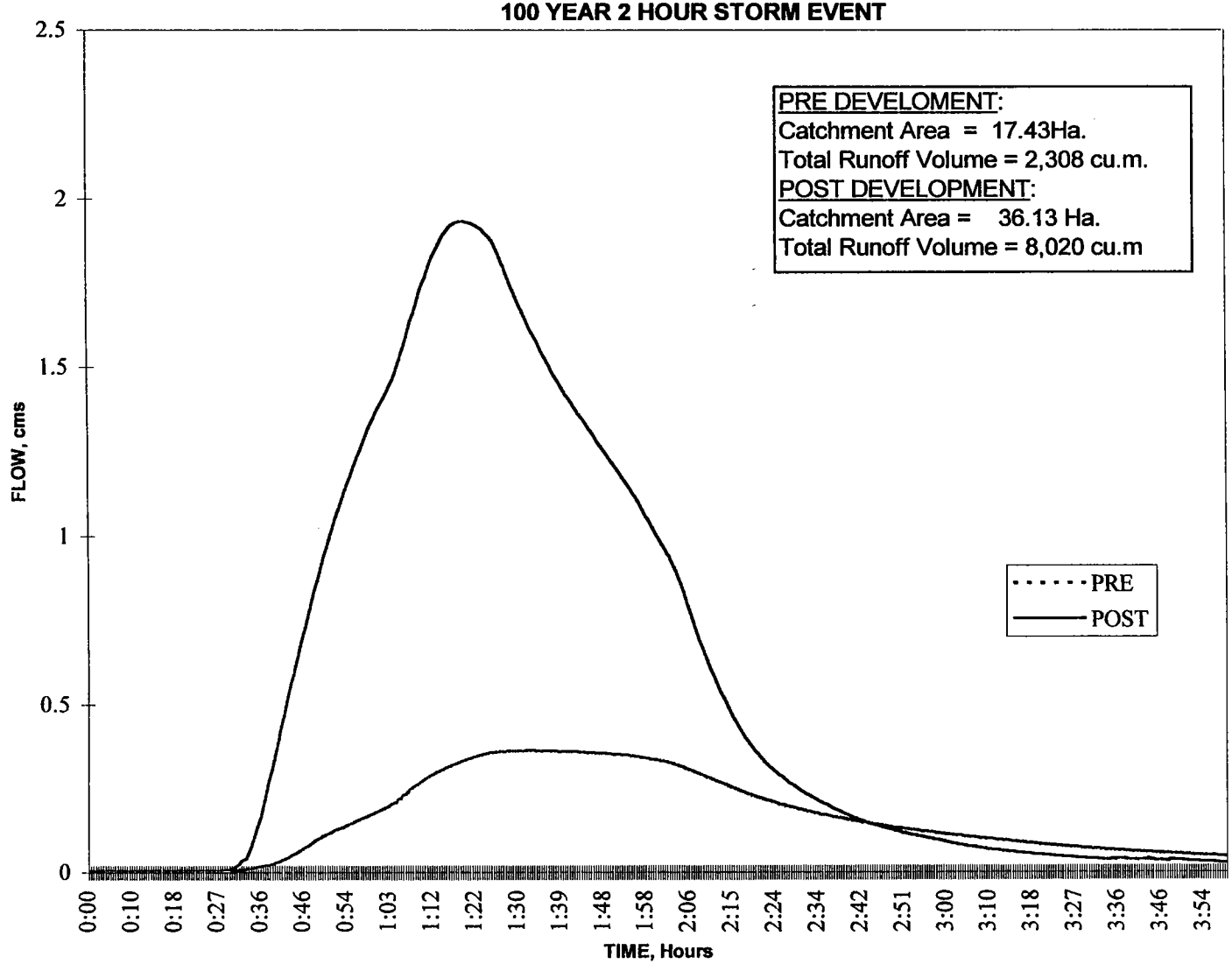


Figure F.
PRE AND POST DEVELOPMENT HYDROGRAPH
100 YEAR 6 HOUR STORM EVENT

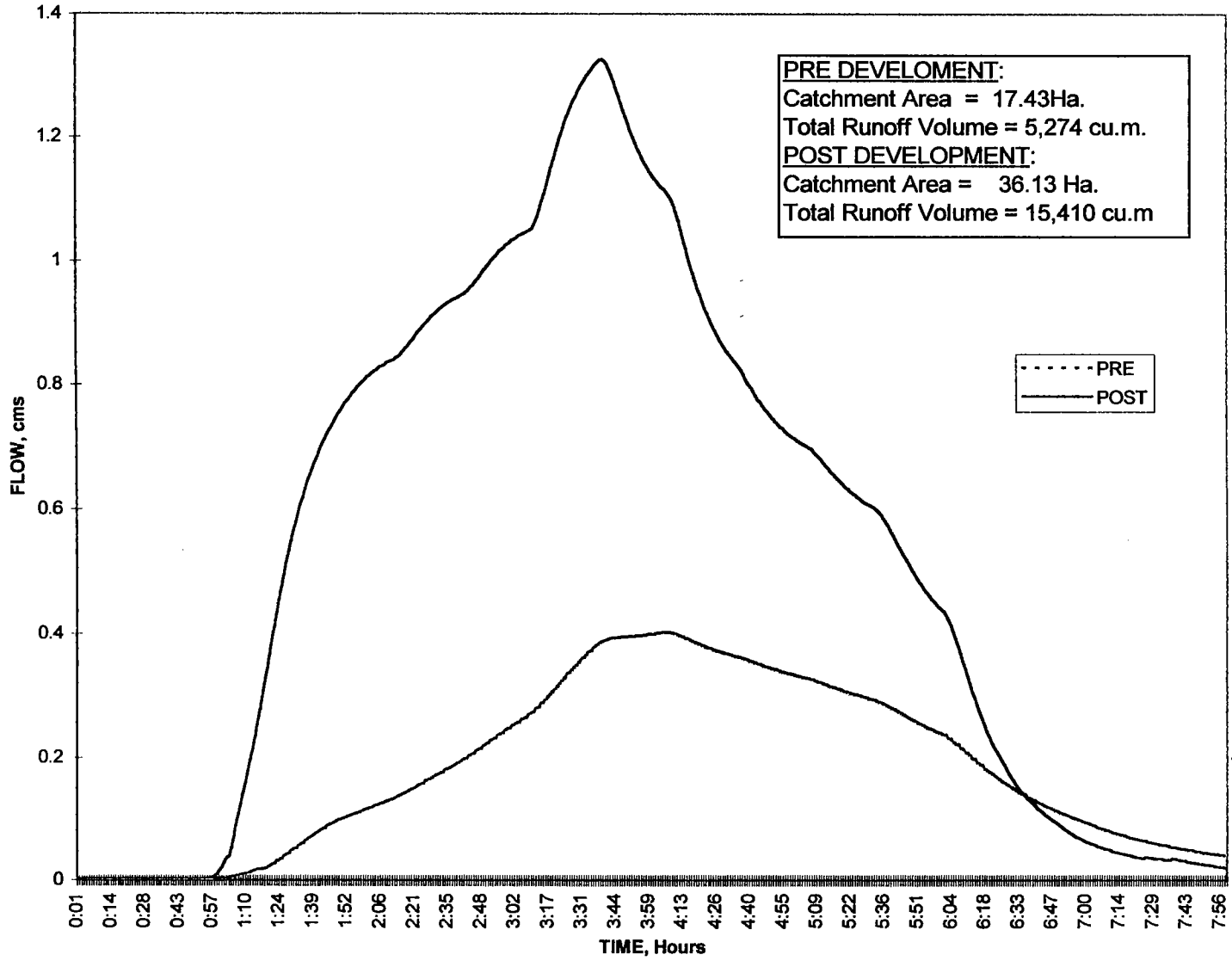


Figure G.
PRE AND POST DEVELOPMENT HYDROGRAPH
100 YEAR 12 HOUR STORM EVENT

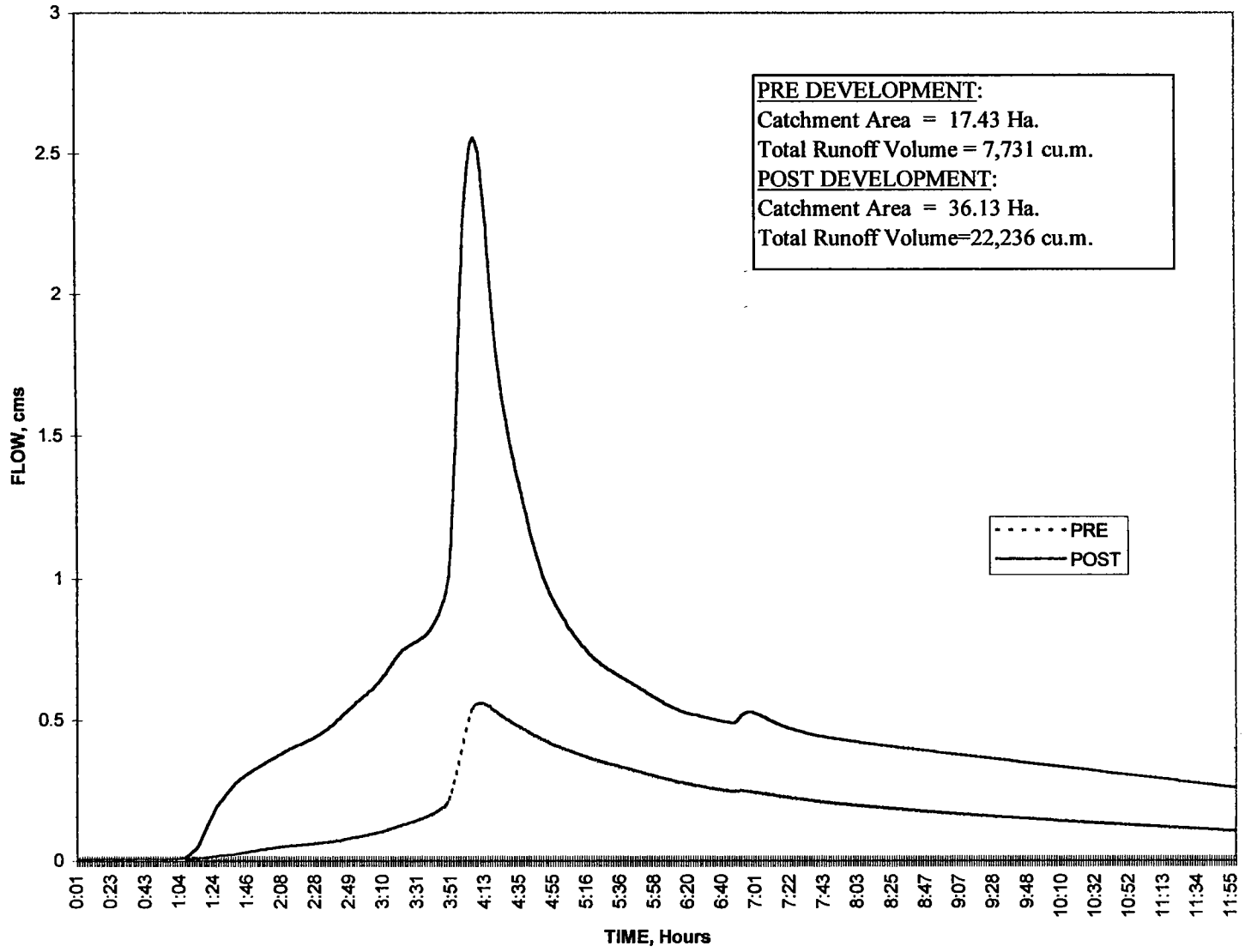
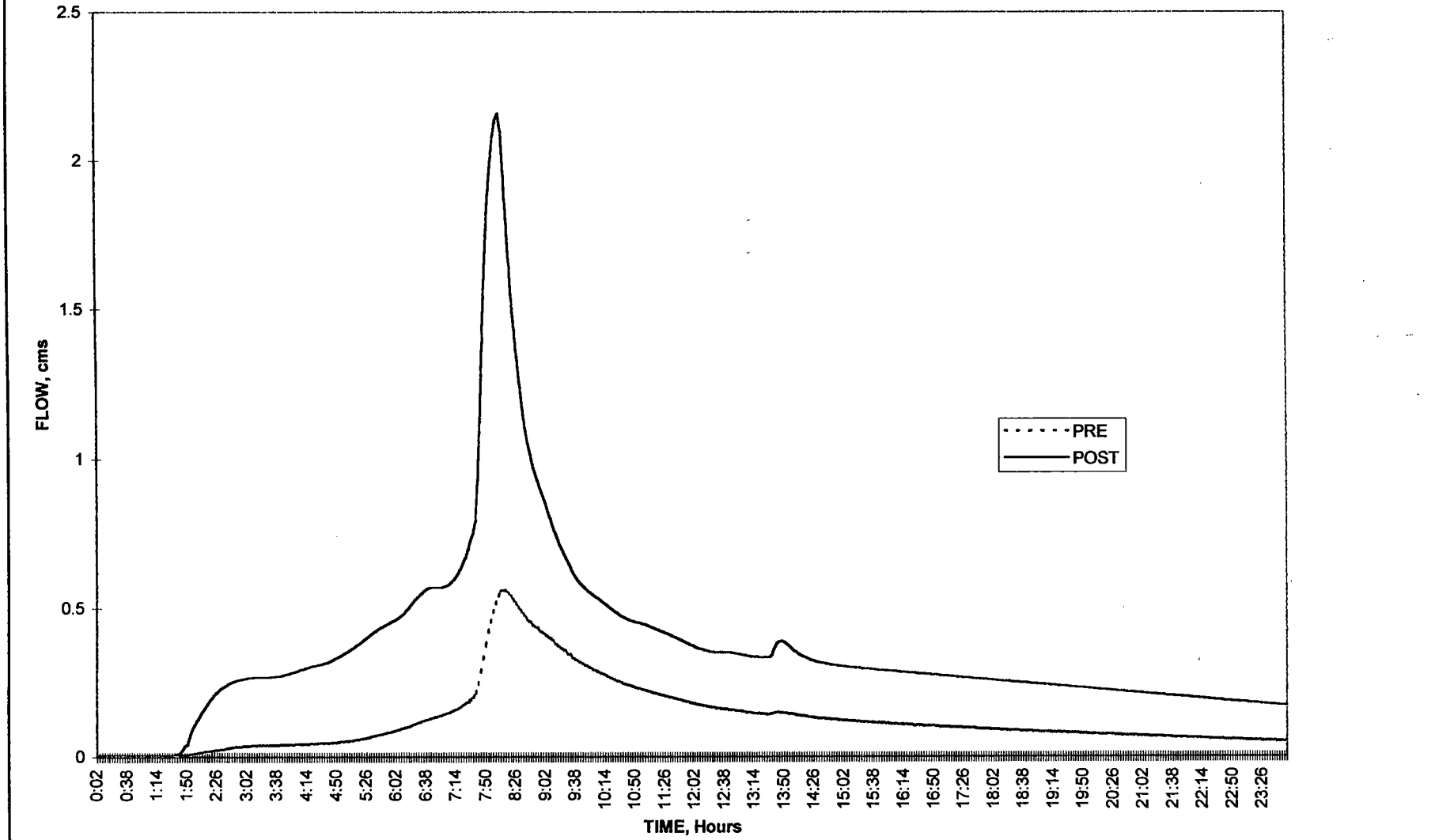


Figure H.
PRE AND POST DEVELOPMENT HYDROGRAPH
100 YEAR 24 HOUR STORM EVENT



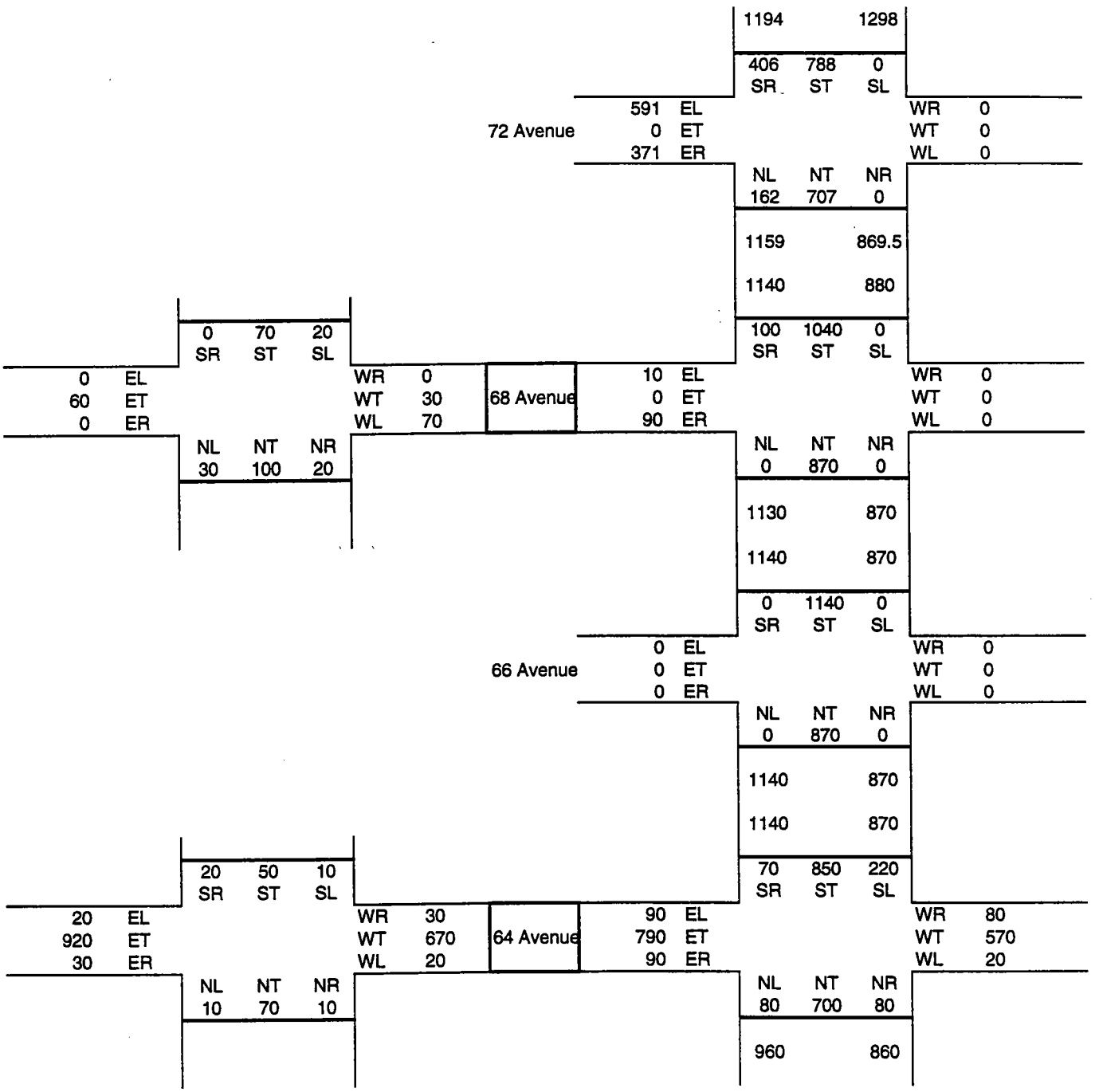
APPENDIX A

TRAFFIC VOLUMES

East Newton Business Park

1999 Traffic Volumes

Growth Factor 3%

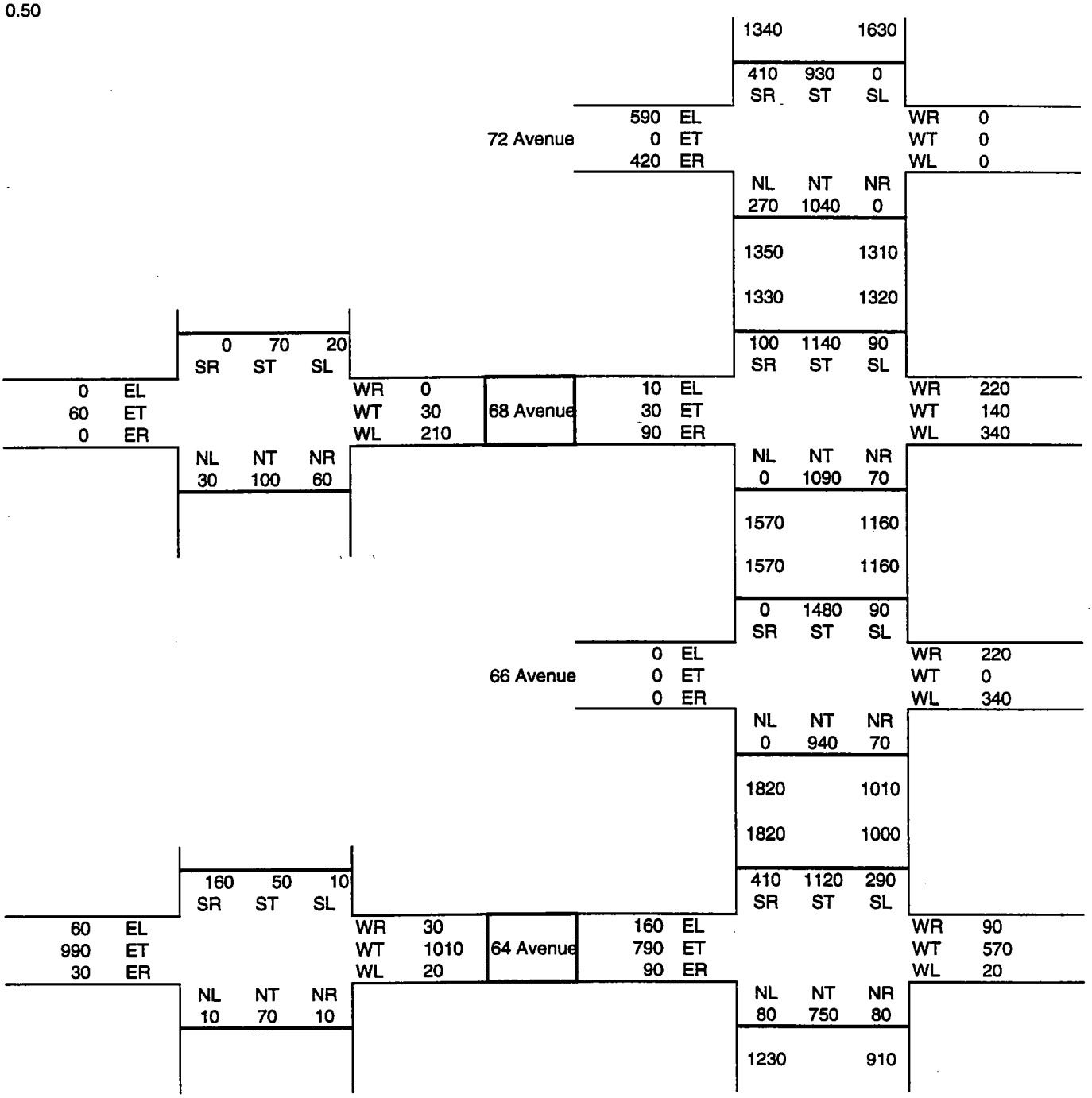


East Newton Business Park

1999 Traffic Volumes + Site Generated

Growth Factor 3%

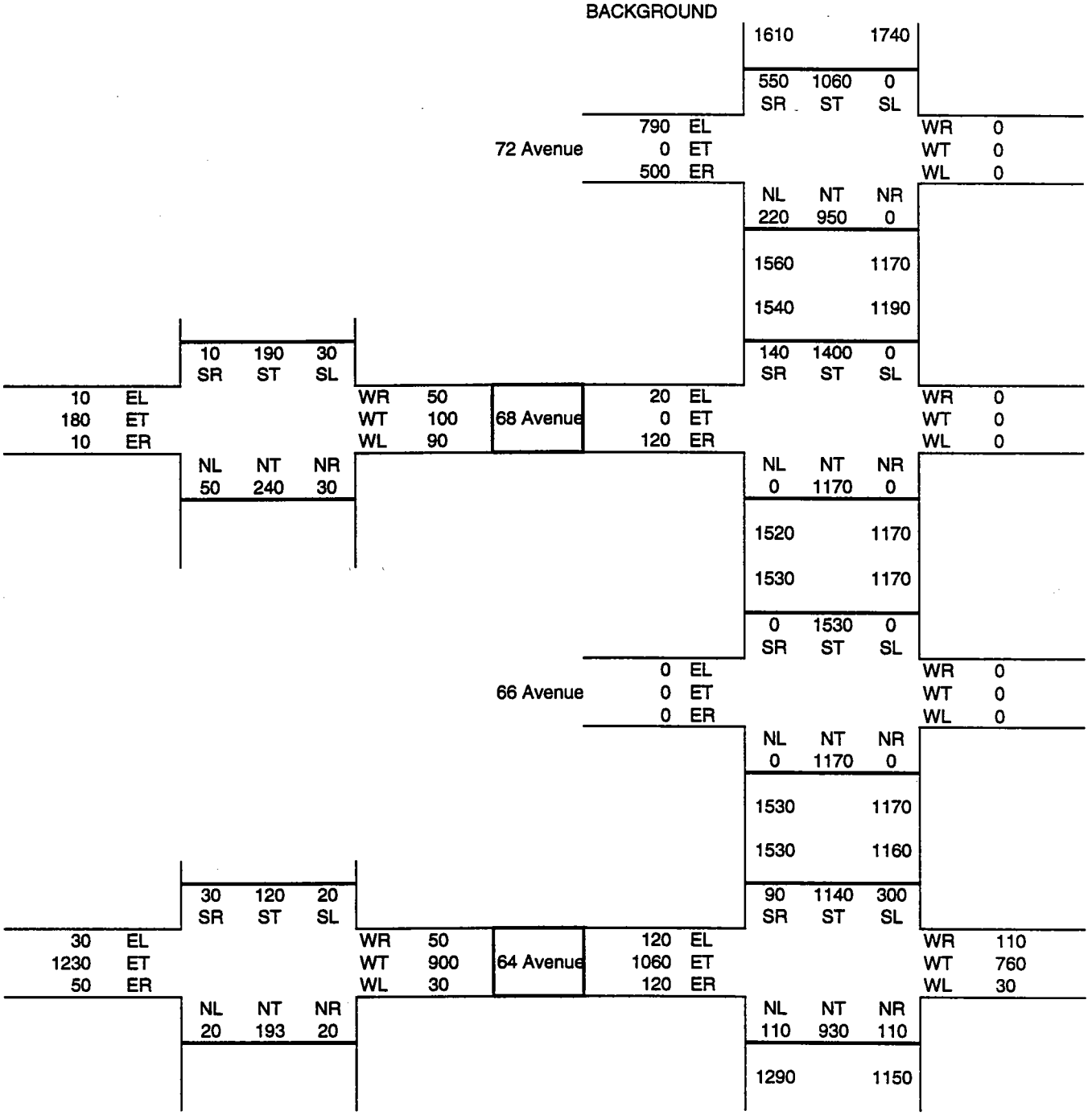
FAR = 0.50



East Newton Business Park

2009 Traffic Volumes

Growth Factor 3%

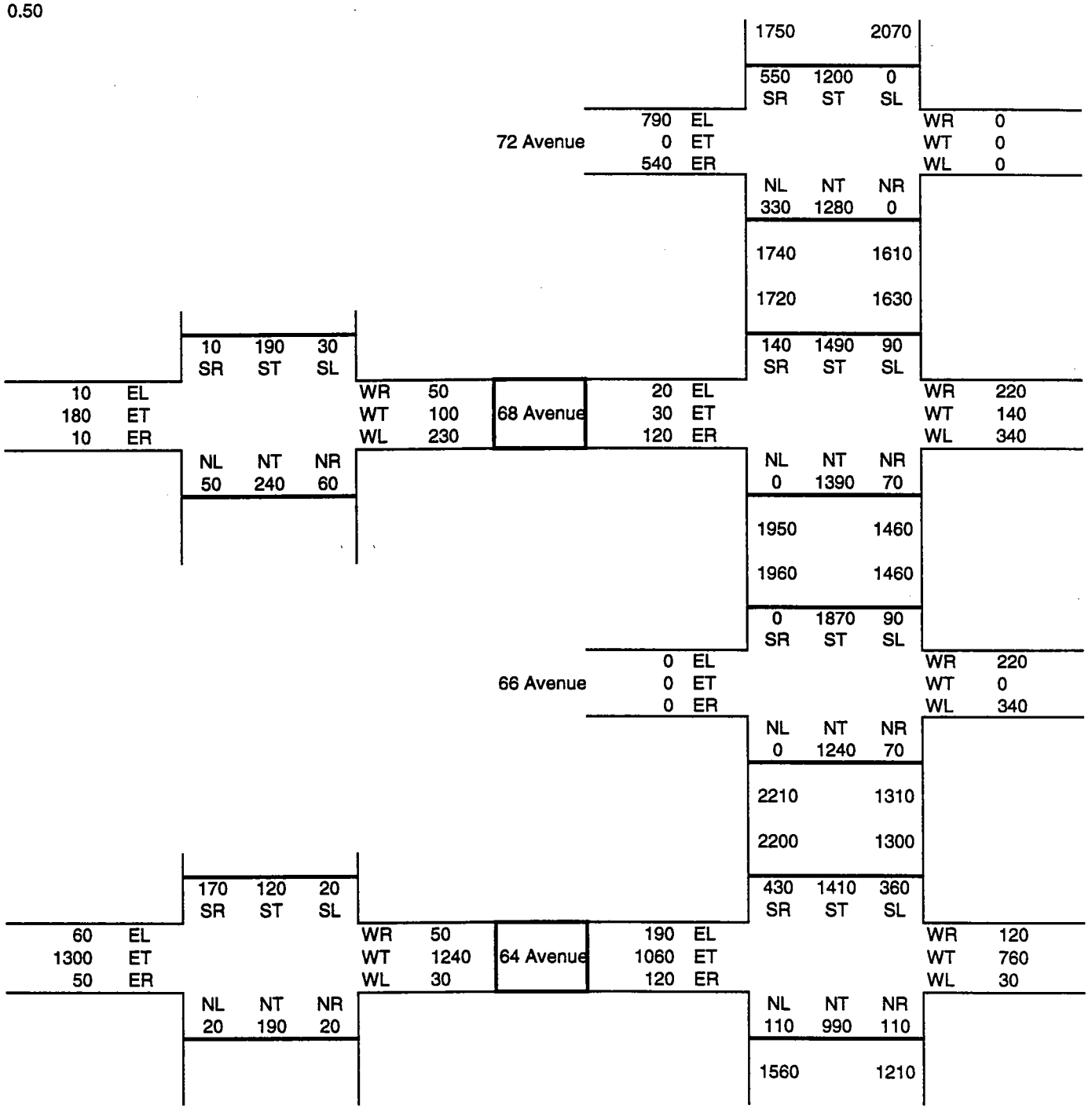


East Newton Business Park

2009 Traffic Volumes + Site Generated

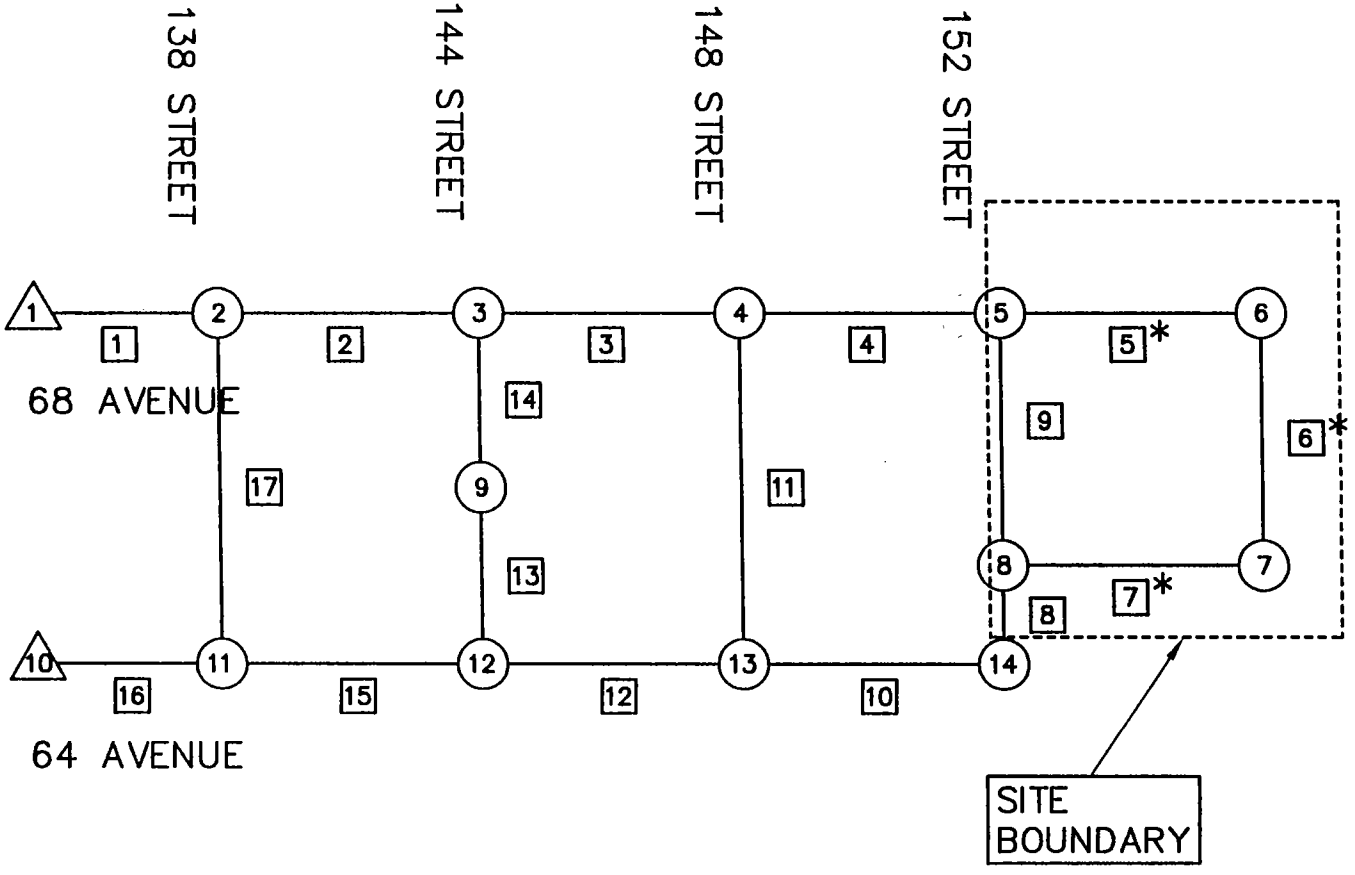
Growth Factor 3%

FAR = 0.50



APPENDIX B

WATER ANALYSIS



WATER MODEL SCHEMATIC

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

LEGEND:

- (13) NODE NUMBER
- [7] PIPE NUMBER
- 10 SOURCE NODE
- * PROPOSED PIPES

FIGURE 7

APLIN & MARTIN CONSULTANTS LTD

NORTH

Scale : N.T.S.

Date : SEPT. 1998

Waterworks All-in-one - Water System Analysis Report

DATA : 97058W2.WK1

FIRST : East Newton Business Park
SECOND : 152 Street and 68 Avenue, Surrey
THIRD : Ultimate Fire Flows -Existing Conditions - 250L/s
FOURTH : 97058W2 - two sources

Short Report

The analysis uses Hazen-Williams's formula
Iteration termination threshold: 0.01000
Maximum number of iterations: 40

There are: 17 Pipes(s)
14 nodes(s)
2 sources(s)
0 booster pump(s)
0 pressure reducing valve(s)
0 check valve(s)
0 pressure sustaining valve(s)

--- Diagnostic output 054 ---

The program terminated after 4 iterations.

The maximum unbalanced head is: 0.00001 m

PIPE TABLE

=> <-------------------- Input -----------------><----------- Output ---------->

Pipe	UpNode	DnNode	Length (m)	Diameter (mm)	Roughness	Flow (l/s)	Velocity (m/s)	HeadLoss (m)	Status
1	1	2	120.00	450.00	125.00	153.83	0.97	0.26	Open
2	2	3	1225.00	300.00	125.00	132.30	1.87	14.45	
3	3	4	810.00	300.00	125.00	127.48	1.80	8.92	
4	4	5	800.00	300.00	125.00	138.18	1.96	10.23	
5	5	6	420.00	300.00	125.00	147.54	2.09	6.06	
6	7	6	410.00	300.00	125.00	102.46	1.45	3.01	
7	8	7	420.00	300.00	125.00	102.46	1.45	3.09	
8	14	8	385.00	300.00	125.00	111.82	1.58	3.33	
9	8	5	410.00	300.00	125.00	9.36	0.13	0.04	
10	13	14	805.00	300.00	125.00	111.82	1.58	6.95	
11	13	4	795.00	300.00	125.00	10.70	0.15	0.09	
12	12	13	800.00	300.00	125.00	122.52	1.73	8.10	
13	9	12	565.00	150.00	100.00	4.82	0.27	0.72	
14	3	9	230.00	300.00	125.00	4.82	0.07	0.01	
15	11	12	1225.00	300.00	125.00	117.70	1.67	11.63	
16	10	11	355.00	300.00	125.00	96.17	1.36	2.32	
17	2	11	795.00	200.00	100.00	21.53	0.69	3.54	

NODE TABLE

<---------- Input ---------><----- Output ----><--- Optional ---><-Input->

Node	Elevation (m)	Demand (l/s)	Pressure (psi)	HGL (m)	XCoord	YCoord	Status
1	54.90		34.94	79.50			ON
2	53.30		36.84	79.24			
3	38.70		37.06	64.79			
4	36.90		26.95	55.88			
5	14.00		44.95	45.65			
6	4.00	250.00	50.55	39.59			
7	9.10		47.58	42.60			
8	13.80		45.29	45.69			
9	23.70		58.36	64.79			
10	50.30		39.37	78.02			
11	34.10		59.08	75.70			
12	19.40		63.44	64.07			
13	15.20		57.90	55.97			
14	5.70		61.52	49.01			

INFLOW TABLE

Node	Pumps	OpCurve	%Estimate	%Actual	Inflow l/s	Status
1	1	pump1	0.5	0.62	-153.83	ON
10	1	pump2	0.5	0.38	-96.17	

BOOST TABLE

Pipe	Pumps	OpCurve	Boost m	Status

<< Booster data not available >>

REDUCING (PRV) TABLE

Pipe	Source	Pressure psi	OpenK	CKV	PRVLoss m	CKVState

<< PRV data not available >>

SUSTAINING (PSV) TABLE

Node	UpNode	DnNode	Pressure psi	Options	DnDemand l/s	Pressure psi

<< PSV data not available >>

CHECK (CKV) TABLE

Pipe	State

<< CKV data not available >>

PUMP1

Flow l/s	Head m
0.00	24.60
250.00	24.60

PUMP2

Flow l/s	Head m
0.00	27.80
250.00	27.80

APPENDIX C

ENVIRONMENAL ASSESSMENT

envirowest
ENVIRONMENTAL CONSULTANTS

April 28, 1999

Aplin & Martin Consultants Ltd.
Suite 201, 12448 - 82nd Avenue
Surrey, B.C.
V3W 3E9

Attention: Mr. Len Robertson, P.Eng.
Project Engineer

Dear Mr. Robertson,

RE: EAST NEWTON BUSINESS PARK - NCP
WATERCOURSE CLASSIFICATIONS

Envirowest has conducted a field assessment of all watercourses within the proposed business park. The purpose of the assessment was to confirm or, where necessary, revise the current classifications as shown on the City of Surrey Watercourse Classification Map. Our findings are described below.

The current watercourse classification map indicates that the business park area includes streams of classes A(O) and C only. As revised, the map should include streams of classes A(O), B and C. Some mapped watercourses do not exist.

With development of the business park it is expected that all of the Class C watercourses and some portions of the class B watercourses will be eliminated. Class C watercourses, by the definition adopted by the City of Surrey and the environmental agencies, have insignificant habitat value and can be displaced without compensation. Class B watercourses, by definition, are not inhabited by salmonids but do provide food/nutrient value to downstream habitats. While the habitat value of Class B watercourses should be preserved, some distinction should be made between Class B habitats that cannot feasibly be re-created (such as ephemeral headwater ravines) and those that can feasibly be re-created. The Class B habitats within the study area are all manmade ditches/swales that were dry when assessed in the fall of 1998. These include the following watercourse sections:

* 66th Avenue, south side, easternmost 60 m;
* 66th Avenue, north side, easternmost 75 m;
* 68th Avenue, south side, westernmost 350 m;
* south of 68th Avenue, 15250 block;
* 6750 block, 15250 to 15350 blocks; and,
* north of 68th Avenue, 15250 block.

ECL ENVIROWEST CONSULTANTS LIMITED
Suite 204 - 800 McBride Blvd.
New Westminster, B.C. V3L 2B8
phone: (604) 521-6500
fax: (604) 521-2208
ecl@axionet.com

Table 1. Watercourse classifications for the East Newton Business Park.

Location	Photo Numbers	Current Classification	Revised Classification
66th Avenue - south side	1 - 2	Class C - all 500 m	Class C - western 440 m Class B - eastern 60 m
66th Avenue - north side	3 - 4	Class C - western 200 m Class A(O) eastern 300 m	Class C - western 425 m Class B - eastern 75 m
North of 66th Avenue at 15350 block	5	Class A(O)	Does not exist
66th Avenue to 68th Avenue at 15450 block	6	Class A(O)	Class B
68th Avenue - south Side	7 - 8	Class A(O)	Class B - western 350 m Class A(O) - east of study area
68th Avenue - north side	9 - 10	Class A(O)	Class C - western 300 m Class A(O) - eastern 75 m and beyond study area
South of 68th Avenue at 15400 block	11	Class A(O)	Does not exist
South of 68th Avenue at 15250 block	12	Class A(O)	Class B
6750 block between 15250 and 15350 blocks	13	Class A(O)	Class B
North of 68th Avenue at 15300 block	14	Class A(O)	Does not exist
North of 68th Avenue at 15250 block	15	Class A(O)	Class B

The proposed wetland to be constructed at the northeast corner of the study area will accommodate sufficient habitat features to offset the loss of these Class B habitats. The

proposed wetland/pond will provide sedimentation and biofiltration functions primarily within about one-half of the area, with food/nutrient production and wildlife habitat within the other half. The lands surrounding the wetland/pond would be landscaped to maximize fish and wildlife values.

Upgrading of the Class A(O) watercourse east of the study area (along the 68th Avenue right-of-way) is anticipated. This will require impact mitigation that may also include compensation habitat.

Attachments A and B show the existing and revised watercourse maps. Pending approval and development of the business park, the watercourse map will require further updating to reflect the ultimate drainage configuration.

Photographs referred to in Table 1 are presented in Attachment C.

Please note that, under the terms of the memorandum of Agreement regarding the watercourse classification system, revisions to the current watercourse classifications require the endorsement of the Ministry of Environment, Lands and Parks and the Department of Fisheries and Oceans.

Yours truly,
ECL ENVIROWEST CONSULTANTS LIMITED

Ian W. Whyte
Senior Project Manager

IWW/
attach.

APPENDIX D

Storm Analysis

1.0 APPENDIX D – STORM ANALYSIS

1.1 FUNCTIONAL PLAN FOR EAST NEWTON PUMP STATION

The Functional Plan for East Newton Pump Station report was being produced by CH2M Gore & Storrie Ltd./Kerr Wood Leidal Associates Ltd. concurrently with this report. A cooperative effort was made between these firms and Aplin & Martin Consultants Ltd. in the selection and use of hydrologic and hydraulic parameters.

1.2 RAINFALL DATA

Rainfall data derived from the Surrey Municipal Hall rain gauge was used for hydrologic analysis of the East Newton study area. The data represents a statistical reduction of raw rainfall data collected between 1963 and 1990. Rainfall totals are listed in Table A.

Table A
Surrey Municipal Hall Rainfall Data

	5 Year Return Period				100 Year Return Period			
Storm Duration (hours)	2	6	12	24	2	6	12	24
Total Rainfall (mm)	**17.7**	**32.5**	**47.3**	**67.7**	**26.2**	**47.8**	**69.4**	**99.1**

For the two and six hour storm durations, the Atmospheric Environment Service (AES) BC coast distribution was used to generate the design storms. For the 12 and 24 hour storms the US Soil Conservation Service (SCS) type IA was used. The design storms are generated as hyetographs that are used as input data in the hydrologic model.

1.3 STUDY AREA DISCRETIZATION

Analysis of the study area is accomplished by defining discrete elements (subcatchments and conduits) within the greater area. Plans of the pre- and post-development catchments are shown in Figures A and B respectively. Schematic diagrams of the catchments as used in the computer modelling are shown in Figures C and D.

1.4 HYDROLOGIC MODELING

Hydrologic modelling of the study area was completed using the SWMM RUNOFF module of the computer program XP-SWMM.

APPENDIX E

UTILITY LETTERS

BC Transit

13401 - 108th Avenue, Surrey, B.C. V3T 5T4 Telephone (604) 540-3000

October 26, 1998

Mr. L.P. Robertson, P.Eng.
Project Engineer
Aplin and Martin Consultants Ltd.
Suite 201 - 12448 - 82nd Avenue
Surrey, BC V3W 3E9

Dear Mr. Robertson:

Re: Transit Facilities for the East Newton Business Park Neighbourhood Concept Plan

This is in response to your correspondence of October 8, 1998, regarding Transit Facilities for the East Newton Business Park Neighbourhood Concept Plan.

We have had the opportunity to review the two alternate land use plans and road classifications for the proposed business park. Our comments are as follows:

1. BC Transit's Ten Year Plan and Five Year Plan contain provisions for improved services along 152nd Street between Guildford and the Semiahmoo Town Centre. It is planned that a more frequent #345 service will be provided as the demand increases along the 152nd Street corridor. At this time, we do not have any plans for providing a local service within the East Newton Business Park. It is notable that the proposed Business Park is with 450 metres walking distance of an existing bus service (#345 route). Upon the further completion of the Business Park and the availability of more information on employment levels, the Greater Vancouver Transportation Authority (GVTA) may consider providing a more direct service, if demand warrants. This could take the form of transportation alternatives to the site, developed in conjunction with future businesses locating here.

2. The advance street plans for both scenarios (Concept A3 and Concept A4) appear to be reasonable in regard to facilitating internal access to the site and providing access from the site to 152nd Street. The City of Surrey should ensure that sidewalks are provided along the proposed streets and along 152nd Avenue. In addition, the City should ensure that bus stops and boarding areas are user-friendly, clearly visible from the street and are well-lit at night.

.../2

3. Existing bus stops are located as follows:

   - southbound 152nd Street @ 66A Avenue (farside); southbound 152nd Street @ 68th Avenue (farside)

   - northbound 152nd Street @ 66 Avenue (farside); northbound 152nd Street @ 68th Avenue (farside)

   Upon the development of 66A Avenue to serve the site, the bus stop situated at northbound 152nd Street @ 66 Avenue (farside) will be relocated to northbound 152nd Street @ 66A Avenue (farside). In addition, if the speed limit along 152nd Street is 70 km/hr (or more), bus bays should be provided for all of the bus stops serving the business park. If the speed limit is less than 70 km/hr, bus bays will not be required. The City of Surrey is responsible for the provision of bus bays. Finally, bus shelters should be provided for all of these bus stops. The City of Surrey should request that the advertising agency responsible for bus shelters situate shelters at these locations.

3. Concept A4 includes a land use designation for "Live & Work", which will provide people with the opportunity to live and work in the same building. We understand that the Live & Work land use designation is an experiment by the City of Surrey. If this arrangement works, it could potentially reduce the transportation demand for commuting purposes to the business park. Additionally, the Live & Work arrangement could potentially increase potential transit ridership during off-peak periods. On these grounds, we would support the scenario that contains the "Live & Work" designation (Concept A4). Within Concept A4, we do not support the alternative land use option (inset map) as it reduces the area designated for Live & Work purposes.

We appreciate having the opportunity to comment on the East Newton Business Park Neighbourhood Concept Plan. Please forward copies of more detailed planning documents of this plan to BC Transit as the development process proceeds.

Yours truly,

Martin Kobayakawa
Transportation Planner

c. G. Leicester
B. Lambert
J. Prokop
K. Chow
M. Lai, City of Surrey
W. Whelan, City of Surrey

BC hydro

proud of our Service

26 October 1998

Your File # 97058

Aplin & Martin Consultants Ltd.
12448 82nd Ave.-suite 201
Surrey, BC

Attention: Mr. Len Robertson,
Project Engineer.

Dear Sir:

Re: East Newton Business Park - NCP
at 68th Avenue and East of 152nd St., Surrey

Thank-you for your letter of October 9th 1998, BC Hydro is looking forward to working together with you on this project.

The existing distribution system on 152nd street would be adequate to serve the initial phases of your project. However, depending on the final total power requirements and timing of the development, a System Improvement Contribution of up to $50,000.00 may be required to upgrade our capacity.

In a development of this nature, the existing distribution lines on the internal roads would remain overhead unless the City intends on requesting beautification of the area by converting any existing lines to an underground system.

BC Hydro would like as much advance notice of any plans for undergrounding, in order to establish adequate corridors, cost sharing and scheduling requirements.

If you have any questions or wish to discuss this further, please call me at 543-6031.

Yours truly,

Tom Vine
Service Planner
LMS/FV Region

cc: Ms. Wendy Whelan, City Of Surrey, Planning Department
Mr. Terry Einarson, P.Eng, BC Hydro , Senior Engineer, Transmission and Distribution.

BCTEL

Your File #: 97058
Exch: Newton
Date: October 29, 1998

Sullivan Station
15079 - 64th Avenue
Surrey, BC
V3S 1X9

Aplin & Martin Consultants Ltd.
#201 – 12448 82 Avenue
Surrey, BC
V3W 3E9

Attention: L.B. Robertson
Project Engineer

Dear Sir:

Re: East Newton Business Park – NCP
At 68 Avenue and East of 152 Street

BC Tel presently has no copper pairs to feed a project of this size along 152 St. To provide service to this project would require a feeder addition from the Newton Central Office at 72 Ave. and 128 St. This is very costly and not feasable to do. The best solution would be to place a "WIC" on your property within a 3m x 5m right of way. This could be on the corner of the Biofiltration (wetlands) at 68 Ave. & 153 St.

By placing a "WIC", you would also receive the benefit of fibre-fed electronic switching as opposed to a copper pair back to the Newton Central Office.

For further information, please contact Rob Birch at 436-8452 or fax 599-4976.

Yours truly,

Rob Birch
Facilities Management - Newton
Network Planning & Standards

RB/kv

BC Gas Utility Ltd.
16705 Fraser Highway
Surrey, British Columbia
Canada V3S 2X7

Tel (604) 576-7000
Fax (604) 576-7155

BC Gas Naturally.

November 03, 1998

Aplin & Martin Consultants Ltd.
Att: L. B. Robertson
12448-82nd Avenue
Surrey, B.C.
V3W 3E9

Your File: 97058

Dear Mr. Robertson:

Re: Newton Community Plan @ 66 Avenue to 68 Ave and East of 152nd Street, Surrey, B.C.

We reviewed your submission and have the following comments:

1. There is a 323mm diameter intermediate pressure 1900 kPa / 175psig gas pipeline located approximately 1.0m west of the 168mm diameter distribution pressure 420 kPa / 60psig gas main on the west side of 152nd Avenue. All proposed road/utility works, over/near the 323mm IP 1900 kPa gas pipeline on 152nd Street, require Pipeline Crossing Permits as per the Pipelines Act.

2. There are approximately 30 existing gas customers in the subject area, indicated by the circled addresses on the enclosed Plate Maps 16-H-3 and 16-I-12. The gas supply to these customers must be maintained until the houses are demoed.

3. The existing 60mm DP/ST (420 kPa) gas main on the north side of 68th Avenue will supply gas to customers on the north side of 68th Avenue.

4. We will design new gas mains from the existing 168mm DP/ST (420kPa) gas main on the west side of 152nd Avenue to the Business Park, via the easterly extension of 66A Avenue, using our typical "double main" design
i.e.: PE Gas mains on both sides of the new/altered 20m wide streets.

5. Future development(s) to the north, east or south may affect the sizing of our gas mains in of the NCP development.

Contact the undersigned at 583-0549, if you require any further information.

Yours truly,

Norman McKinnon

N.J. McKinnon, AScT
Tech 2 - Utility Planner

h:norm\03nov98

ROGERS™

Rogers Cablesystems Limited
Surrey, Abbotsford & Fraser Divisions
10445 138th Street
Surrey, B.C. V3T 4X3
Phone: (604) 436-1111
Fax (604) 930-3407

January 5, 1999

Aplin & Martin Consultants Ltd
Suite 201 - 12448 - 82 Avenue
Surrey, B.C.
V5W 3E9

Your File #97058

ATTENTION: L.B. Robertson, P. Eng

Dear Sir:

RE: EAST NEWTON BUSINESS PARK - NCP at 68 AVENUE, EAST OF 152 STREET

After reviewing the above mentioned project, I have determined that there will be minimal impact on our existing services to provide cable to the new business park.

If you have any questions, please call me at 930-3424.

Sincerely
ROGERS CABLE T.V. LIMITED

Michael Jensen
Project Coordinator

APPENDIX F

1. CAPITAL WORKS COSTS FOR DCCS AT BUILDOUT
2. CAPITAL WORKS FOR PROPOSED LEVY

CAPITAL WORKS COSTS FOR DEVELOPMENT COST CHARGES AT BUILDOUT (1998 DOLLARS)

A. Arterial Roads		
1. Sidewalks (835 m @ $75/m)		$62,600
2. 152 St./68 Ave. Traffic Signal		$90,000
3. 152 Street/66A Avenue Traffic Signal		$90,000
4. 152 St./66A Ave. Bus Bay		$6,800
5. 152 St./66A Ave. South Bound Left Turn Median		$20,300
6. 152 St./68 Ave. South Bound Left Turn Median		$20,300
	Total Arterial Roadworks	$290,000
B. Sanitary Works		
1. Lift Station & Appurtenances		
a) Civil / Mechanical / Electrical		$575,000
- Static Head = 15.5 m		
- Duplex Pumping Unit = 20 HP each		
b) Emergency Pump Generator		$87,500
c) Flow Measurement		$17,500
d) Site Preparation Civil Works (fencing, parking)		$9,800
2. 250 Diameter Force Main (430 m @ $390/m)		$167,700
3. Connection to GVS&DD Sewer		$4,500
	Total Sanitary Works	$862,000
C. Storm Works		
1. 68 Avenue Ditch Upgrading		$30,000
2. Drainage Pump Station		$1,493,000
	Total Storm Works	$1,523,000
	TOTAL CAPITAL WORKS	$2,675,000

CAPITAL WORKS FOR PROPOSED LEVY
(1998 DOLLARS)

A. Storm Works

1. Biofiltration Pond		$592,400
2. Land Acquisition	(0.75 acres and 1.55 acres in Floodplaiin)	$331,000
	Total Storm Works	$923,400
	TOTAL CAPITAL WORKS	$923,400

The storm sewer levy was calculated as follows:

$$\frac{\text{Total Biofiltration Pond Costs}}{\text{Total Area of Business Park Lots}}$$

$$\frac{\$923{,}400}{70.19Ac. + 0.77Ac.} = \$13{,}013/Acre$$

Use $13,000/Acre

APPENDIX G

UNIT RATES FOR NCP PROJECTS

SURREY
CITY OF PARKS

CITY OF SURREY
Engineering Department
14245 - 56 Avenue, Surrey, British Columbia, Canada V3X 3A2
Phone: (604) 591-4175 Fax: (604) 591-8693

FACSIMILE TRANSMITTAL FORM

TO:		FROM:	
Name:	All NCP Consultants	Name:	Chris JA Whitlock
Company:		Title:	NCP Coordinator
Fax No.:	(604) (area code)	File No.:	2350-000
Phone No.:	(604) (area code)	Date:	Feb 16, 1996

Total Number of Pages: 2 (including cover page) Original to Follow: Yes: ☐ By Mail: ☐ By Courier: ☐ No: ☒

COMMENTS: RE: Unit Rates for Roads/Utilities within NCP areas

Please use the following rates for NCP Road cost estimates within your Stage 2 financial [illegible] includes Engineering, Administration, Taxes):

Sidewalk	$50/m
Concrete Curbing	$25/m
Boulevard Strip	$14/m
Pavement Widening	$30/sq.m.
Streetlights and Conduit	$100/m
Asphalt Overlay	$6/sq.m.

RECEIVED
ENGINEERING LTD.
FILE No.
DISTRIBUTION
NAME INIT.

Unit Rates for Sanitary/Storm/Water are attached. Please call with any questions you may have.

Best Regards
Chris JA Whitlock

1995 Unit Rates

Pipe (mm)	Sanitary & Storm Construction Cost Only*	Sanitary & Storm +50%**	Pipe (mm)	Water *Construction Cost Only	Water +50%**
250	$240 /m	$360 /m	200	$250 /m	$375 /m
300	$250 /m	$375 /m	250	$260 /m	$390 /m
375	$290 /m	$435 /m	300	$280 /m	$420 /m
450	$320 /m	$480 /m	350	$310 /m	$465 /m
525	$340 /m	$510 /m	400	$320 /m	$480 /m
600	$380 /m	$570 /m	450	$350 /m	$525 /m
675	$420 /m	$630 /m			
750	$510 /m	$765 /m			
900	$620 /m	$930 /m			
1050	$720 /m	$1,080 /m			
1200	$840 /m	$1,260 /m			
1350	$970 /m	$1,455 /m			
1500	$1,110 /m	$1,665 /m			

* Construction Cost is the estimated cost to supply and install per meter the required pipe.
Pertinents such as catchbasins, manholes, tees, hydrants, valves, house services, restoration, rehab., etc. are included.
Major Facilities such as Diversion structure, PRV stations, Lift stations, etc. are not included.

** A 50% factor is used to cover all other costs including GST, design & admin., project contigency, etc.
For all NCP's, this 50% factor must be applied to generate total cost estimates and the basis for funding requirements.

road access or oversizing of the water main required). Phase Four completes the extensions of the cul-de-sacs and servicing and allows for flexibility in the lot sizing as dictated by market demands.

3.5 FINANCING OPTIONS

Table 3.3.2 in Section 3.3 demonstrates that there is a shortfall of DCC revenue ($557,378) from the study area to pay for the sewage lift station. However, this project is identified in the City's 10 Year Capital Plan and is scheduled for construction, dependent on need, in 2002. Collectively, the two East Newton NCP's (north and south sectors) and the Business Park will eventually generate sufficient sanitary DCC revenue to cover the sewage lift station costs. Therefore, there is no need to impose a levy for collection of the shortfall from the East Newton Business Park NCP.

Funds are available for drainage pump station through DCCs and the City's planned schedule to construct the drainage pump station in 2004.

The sole financing issue therefore revolves around the timing for the construction of the works. For development of the Business Park to proceed, there are a number of options available:

- proponents could wait until the residential uplands develop at which time their DCCs would be used to reimburse the upland developers;
- proponents could proceed ahead of the upland residential development and enter into an agreement with the City to recover their costs through a Development Works Agreement or DCC rebate; or
- proponents could wait for the City to construct the works in accordance with the City's 10 Year Capital Plan.

3.6 CONCLUSIONS

Any of the financial options are achievable. The least risk for a proponent is to wait until 2004 when the sewage lift station and the drainage pump station have been constructed.

The developer can proceed sooner than the scheduled construction of the works by frontending the costs and seeking an agreement with the City to recover the costs as development proceeds in other benefiting areas.

- End of Document -

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